

Attention deficit hyperactivity disorder:

clinical update

Attention deficit hyperactivity disorder (ADHD) is characterised by inappropriate levels of inattention, hyperactivity, and impulsivity: the core symptoms. It is the most common neurobehavioural childhood disorder affecting 5% of children and 2–4% of adults worldwide.¹ The National Institute of Health and Care Excellence (NICE)¹ acknowledges ADHD as a lifespan developmental disorder: up to 60% of children have difficulties in adulthood.² Each GP has approximately 20 children and 20 adults with ADHD at one time. Many remain undiagnosed and often suffer unnecessarily with adverse long-term outcomes.

ADHD is highly heritable, occurring more frequently in boys.¹ Those without hyperactivity, particularly girls, tend to be overlooked. A positive family history is the biggest risk factor for ADHD.¹ ADHD can affect mental health, behaviour, self-esteem, and emotional development in children and adolescents and causes significant dysfunction along with parental distress. Children with ADHD often underperform academically, with increased school truancy and expulsion.³

Untreated ADHD places heavy demands on health, social, and educational resources. This group of patients should be considered when planning child mental health, educational services,¹ and adult psychiatry services with seamless transition services for adolescents.

NEUROPHARMACOLOGY

Structural and functional differences exist in the brains of patients with ADHD, including slower electrical responses to certain stimuli and a reduction in dopamine receptors, correlating with inattention. First-line medications increase dopamine and noradrenaline release in the extraneuronal space. Others block neurotransmitter transport and reuptake.

CLINICAL FEATURES AND DIAGNOSIS

Some core symptoms may be absent;

hyperactivity often reduces with age. Impulsivity causes less ability to think of behaviour consequences and a tendency to live for the moment. Some people with ADHD exhibit more hyperactivity and impulsivity while others are predominantly inattentive (attention deficit disorder).

ADHD IN CHILDREN

Parents of a child with suspected ADHD may consult their GP following concerns about impulsive behaviour, distractibility, poor concentration, imminent suspension, recurrent exclusions from school, or entry to the youth justice system. They may have concerns about mental health if a child is excessively oppositional, has dyslexia, organisation problems, sleep difficulties, anxiety, tics, abnormal motor control (clumsiness), poor self-esteem, and/or difficulty in coping. Asking about core symptoms and complications often helps with diagnosis. ADHD usually coexists with conditions such as oppositional defiant disorder, autistic spectrum disorder (ASD), mood instability, conduct disorder, and specific learning difficulties. These may mask core symptoms. Children with ADHD can have impaired social skills and may behave inappropriately in social settings. Antisocial behaviour is more likely in those with early onset of conduct disorder, learning problems, and environmental adversity. The high prevalence of untreated ADHD among the youth justice population is alarming, given there is a biological lack of self-control.

ADHD IN ADULTS

Adults with untreated ADHD may have learned to compensate. They may have interpersonal relationship and employment problems due to verbal abrasiveness, disorganisation, poor listening, dogmatic thinking, or low self-esteem. Previous diagnoses of personality disorder or bipolar disorders may need reviewing. Parents of

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Table 1. ADHD pharmacological treatments in the UK (sorted alphabetically by brand)

Preparation	Active Ingredient	Dosage	Duration of action
Concerta® XL ^a (Janssen-Cilag Ltd, High Wycombe, UK; 18, 27, 36, 54 mg tablets)	Methylphenidate	Age 6–17 years: 18–54 mg od. Increase weekly by 18 mg if necessary. Maximum licensed dose is 54 mg/day	10–12 hours
Elvanse® (Shire Pharmaceuticals Ltd, Basingstoke, UK; 30, 50, 70 mg capsules)	Lisdexamfetamine	Age 6–17 years: 30–70 mg od. Increase weekly by 20 mg if necessary. Maximum licensed dose is 70 mg per day	13 hours
Equasym® XL ^a (Shire Pharmaceuticals Ltd, Basingstoke, UK; 10, 20, 30 mg capsules)	Methylphenidate	Age 6–17 years: 10–60 mg od. Increase weekly by 5–10 mg if necessary. Maximum licensed dose is 60 mg/day	8 hours
Medikinet® XL ^a (Flynn Pharma Ltd, Dublin, Ireland; 5, 10, 20, 30, 40 mg capsules)	Methylphenidate	Age 6–17 years: 10–60 mg od. Increase weekly by 5–10 mg if necessary. Maximum licensed dose is 60 mg/day	8 hours
Methylphenidate IR ^a (immediate release; 5, 10 and 20 mg tablets)	Methylphenidate	Age 6–17 years: 5 mg od or bd. Age <6 years: 2.5 mg od or bd; increase weekly by 5–10 mg if necessary. Maximum dosage is 0.7 mg/kg per dose or 2.1 mg/kg daily in divided dosage	4 hours
Strattera® ^a (Eli Lilly and Company, Basingstoke, UK; 10, 18, 25, 40, 60, 80 mg capsules)	Atomoxetine	Age >6 years (with body weight ≤70 kg): 0.5 mg/kg/day for 7 days usually as a single dose. Child/adolescent ≥70 kg: 40 mg daily for 7 days. Maximum daily dose is 1.8 mg/kg/day or 120 mg/day	N/A

From UK Electronic Medicines Compendium of Summary of Product Characteristics (7 March 2013).⁴ ^aFirst-line treatments. *bd* = twice daily. *IR* = immediate release. *N/A* = information not provided in Summary of product characteristics. *od* = once daily.

children with ADHD may also have the condition.

MANAGEMENT OF ADHD

The GP role

A child with suspected ADHD and/or coexisting difficulties, needs referral to a consultant paediatrician or child/adolescent psychiatrist for assessment and evaluation. The picture is often complex and may be unclear due to the masking of underlying difficulties but the suspicion of ADHD should be aroused with presentations as described above.

The specialist may introduce an agreed care pathway for ADHD and a protocol of referral criteria for GPs to facilitate appropriate referrals. Meanwhile, GPs can introduce behavioural and supportive management strategies, particularly parenting advice. Parents can be introduced to positive parenting strategies through leaflets or local parenting courses, which will help support a child's self-esteem. Attributing difficult behaviour to 'bad parenting' is unhelpful as parents may be struggling to cope with their child with ADHD or may have ADHD themselves.

Cognitive behaviour therapy and specific counselling or social skills training may help. Local, independent ADHD coaches may be available to provide support and advise families about daily functioning with ADHD. Most children are effectively

helped by combined strategies: medication improves core symptoms so patients are more receptive to psychosocial supports.

Adolescents need guidance through difficulties concerning school, family, and friends. They require advice about increased risks of antisocial behaviour, driving accidents, substance misuse, money management difficulties, and relationship problems. This information can usually be provided by the specialist as appropriate.

Adults with suspected ADHD or complications, not diagnosed in childhood, should be referred to an appropriate mental health specialist for assessment.¹ Patients with ADHD benefit from an integrated, multidisciplinary, specialist ADHD team.¹ Family, school, GP, and paediatrician or psychiatrist working together achieve the best outcomes. Following specialist assessment, GPs provide accessible support for the patient and family, and can help with ongoing monitoring of problems between specialist review appointments. GPs' support in prescribing, as specified by the consultant, is extremely beneficial to the patient.

Pharmacological treatment

Children and adults with significant ADHD generally warrant trial of medication. Use of medication in ADHD is effective, internationally approved, and a well-accepted practice throughout the UK.¹ Often

Further resources

Useful information and resources about ADHD for parents, children and adults can be found at:

www.addiss.co.uk

www.adhdandjustice.co.uk

www.chadd.org

a flow-on improvement to self-esteem and social problems occurs. Education problems, behaviour, and other difficulties improve more gradually.

Table 1 lists medications for ADHD treatments licensed in the UK.⁴ Stimulants (methylphenidate [MPH] and dexamfetamine) are effective within 20–30 minutes and last 4–12 hours (depending on formulation).⁵ Long-acting modified-release MPH formulations give smoother and more effective control than short-acting medications.⁶ Long-acting lisdexamfetamine has been available in the UK since March 2013. Fine tuning of dose and timing improves efficacy and modifies short-term side effects, the commonest being sleep difficulty and appetite suppression. Atomoxetine is a non-stimulant alternative.⁶ No long-term side effects of medication have been reported with over 50 years of use.⁵ The EU-research network, Attention Deficit Hyperactivity Drugs Use Chronic Effects (ADDUCE) is currently prospectively monitoring long-term side effects of ADHD medications.

Psychosocial strategies alone may be effective in those with mild ADHD. These include educational, behavioural, and other psychosocial support, such as cognitive behaviour therapy and use of a coach or mentor. Other support provision by specialists may involve neurofeedback (evidence-based operant conditioning programme), ASD assessments, educator discussions, specific educational supports, social service involvement, or liaison with the Youth Justice Team, as appropriate.

IMPLICATIONS FOR PRIMARY CARE

Patients with ADHD and their families significantly benefit from effective management, with wider implications for society. International and UK studies have clearly shown that those who develop antisocial behaviours are more likely to enter the justice system. Untreated individuals often suffer unnecessarily, with serious adverse outcomes. NICE recommends early identification and management involving a combination of pharmacological and psychosocial strategies. GPs can help to identify and support these patients. Current strengthening of the role of GPs as both providers and commissioners could offer real potential to support adequate child and adult services, consistent with NICE recommendations. Untreated ADHD costs on society and patients far outweigh effective service provision costs.¹ An integrated, multidisciplinary approach is critical for the long-term management success of patients with ADHD.

Competing interests

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