

PedsCases Podcast Scripts

This is a text version of a podcast from PedsCases.com on "ADHD." These podcasts are designed to give medical students an overview of key topics in pediatrics. The audio versions are accessible on iTunes or at www.pedcases.com/podcasts.

ADHD

Developed by Ori Scott and Dr. Helly Goetz for PedsCases.com.
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Introduction

Hi, my name is Ori Scott and I am a medical student at the University of Alberta Faculty of Medicine and Dentistry. This podcast has been reviewed by Dr. Helly Goetz, Associate Professor and Director of Pediatric Neurology at the Stollery Children's Hospital, Edmonton, Alberta. This podcast will review the approach to Attention-Deficit/Hyperactivity Disorder, also known as ADHD, including diagnostic criteria, investigations, differential diagnoses, co-morbidities and treatment.

An 8 year old boy arrives at the clinic with his parents. His mother reports that his school teacher complains about the boy's behaviour in class; he seems to be fidgety, inattentive, and constantly distracted, despite functioning at grade level in reading, writing, and math. The teacher says he can never await his turn, be it in class or when playing with his friends during recess. The parents tell you that he is always hyperactive at home, and would never sit still, not even during supper. The teacher suggested that the boy might have ADHD, and the parents are wondering what that is, and whether there is anything that could be done for their child.

ADHD is one of the most common childhood behavioural disorders, with prevalence ranging from 5-8%. Boys are more commonly affected than girls.

Diagnostic Criteria

ADHD is a clinical diagnosis. The diagnostic criteria for ADHD are based on the DSM-IV and are divided into 2 clusters of symptoms: the first group describes symptoms of inattention, whereas the second relates to hyperactive and impulsive behaviour.

We will now review these groups.

Start by asking about symptoms of inattention. For example, in regards to schoolwork or tasks which require sustained mental effort, does the patient often fail to pay close attention to details, fail to finish tasks, or avoids them altogether? Do they have difficulty

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sustaining attention in tasks or play activities? With respect to organizational skills, it is important to ask whether the patient has difficulty organizing activities, or if they often lose things necessary to complete tasks, such as toys, school assignments, or books. Finally, it is important to consider whether the patient is often forgetful, easily distracted, or seems not to listen when spoken to directly.

Evaluation of hyperactivity-impulsivity is performed in a similar manner. Starting with the assessment of physical temperament, does the patient often fidget with hands or feet, squirm in seat or act as if "driven by a motor"? Do they often run or climb excessively, or leave their seat, in situations in which it is inappropriate? At times when careful listening is required, does the patient often interrupt or intrude on others, blurt out answers before questions have been completed, or have difficulty awaiting turn? Finally, with regard to quiet activities, does the patient often talk excessively or have trouble engaging in leisure activities?

For a diagnosis of ADHD to be made, 6 or more of the symptoms described in the inattention group, and/or in the hyperactivity-impulsivity group should have begun before the age of 7 years, and should have persisted for at least 6 months. Moreover, the symptoms should be inconsistent with the patient's developmental level, and should occur to a degree which is maladaptive and interferes with the patient's normal function. Finally, the symptoms should take place in at least 2 settings. Thus, symptoms which only take place in one setting, such as school or home, do not qualify for a diagnosis of ADHD, and may stem from a variety of other reasons, such as hostile peers, large class size, or a chaotic home environment. In order to determine whether symptoms are consistent or specific to a certain setting, it is important to receive input regarding the patient's behaviour not only from parents/caregivers, but also from other sources, such as the teacher.

Investigations

Although the above mentioned behavioural criteria are currently the gold standard for diagnosis of ADHD, other tools also exist which may support such diagnosis. One such tool is the Vanderbilt ADHD rating scale for parents and teachers, which is a questionnaire endorsed by the American Academy of Pediatrics. Other commonly used questionnaires include the Childhood Behavioural Checklist, or CBL, and the Connor's questionnaire for parents, teachers, and self-evaluation. More objective methods for diagnosis of ADHD include the computerized continuous performance test, and the test of variables of attention. However, the correlation of these measures with the behavioural disorder is not sufficient to replace the DSM criteria, and they are not required to establish a diagnosis.

Differential Diagnosis and Co-morbidities

Prior to investigation of medical etiology, a thorough evaluation of social stressors should be performed to rule out environmental factors as the cause of the symptoms. It is imperative to note who the caregivers are (for example- parents vs. foster care), what the home situation is, and whether there is any suspicion of abuse.

If the patient's difficulties occur exclusively in the school setting, an evaluation for learning difficulties such as a learning disability should be pursued. Social relationships within the school setting should also be reviewed.

It is essential to remember that behavioural symptoms of inattention, hyperactivity and impulsivity are not exclusive to ADHD. Therefore, before determining a diagnosis of ADHD, one must consider and rule out alternative conditions which may result in similar symptoms. Some of the most prominent conditions on the differential for ADHD include pervasive developmental disorder, mood disorder, anxiety disorder, and personality disorder. Furthermore, some neurologic disorders may also present with symptoms that meet the criteria for ADHD; these include some forms of epilepsy, and neurogenetic syndromes. Other conditions which may be mistaken for ADHD, and should be ruled out, include vision or hearing loss, and hyperthyroidism.

Should the behavioural symptoms occur due to any of the above conditions, treatment should be directed at them before concluding that a child has ADHD.

After ruling out alternative diagnoses, it is also important to keep in mind that ADHD is associated with a few co-morbidities. These include restless leg syndrome, tic disorders, mood and affective disorders. It is therefore important to address and treat any of these conditions, even if diagnosed in the setting of ADHD.

Treatment

Once a diagnosis of ADHD has been established, pharmacologic therapy should be considered, with the drugs of choice being stimulants, which enhance dopaminergic and noradrenergic transmission. Stimulants have been shown to improve cognitive ability, school performance, and behaviour.

Commonly used stimulants include methylphenidate preparations, dextroamphetamine and amphetamine salts. It is important to keep in mind that these medications act in slightly different ways, and a lack of response to one stimulant does not predict the response to others.

Both short and long-acting forms of stimulants are available, which generally differ by their dose-response curves. Short-acting forms may have an effect within 20-30 minutes, peaking within 2 hours. Their effects are noticeable for an average of 4 hours. The long-acting preparations have an onset of about 30-40 minutes, they reach a plateau within 2 hours, and are effective for a total of 8-12 hours.

The most commonly reported side effects of stimulants are appetite suppression and sleep disturbance, accompanied by changes in heart rate and blood pressure. Therefore, patient's growth parameters should be monitored while on these medications. Uncommon side effects include mood disturbances and lethargy.

In the last decade, there has been a debate in regard to cardiac side effects and potential risk of sudden death resulting from the use of stimulants. Current guidelines dictate that an ECG should not be routinely done in a healthy child before prescribing stimulants, and careful history ruling out any heart disease should suffice. Inpatients with a history of cardiac disease, pediatric cardiology should be consulted.

Another class of drugs which may be used in the treatment of ADHD is the noradrenergic potentiators, such as atomoxetine. These drugs usually cause less appetite suppression and insomnia.

Lastly, since mood and affective disorders are highly associated with ADHD, tricyclic antidepressants may benefit patients who suffer from ADHD and a co-morbid mental disorder.

The use of non-pharmacologic therapies for ADHD, such as behavioural therapies, is widely common. In fact, a combination of behavioural and pharmacological treatment has been shown to be far more effective than medication alone. Other non-pharmacologic therapies, such as biofeedback, dietary restriction and others are still controversial.

Summary

In summary, ADHD is the most common behavioural disorder in pediatric patients, with diagnosis being purely clinical, and based on the DSM-IV criteria. Before initiating clinical investigation, careful assessment of the patient's home and school environment should be performed, to rule out any underlying psychosocial causes.

It is not necessary for a child to have symptoms of both inattention and hyperactivity/impulsivity to be diagnosed with ADHD. One should ascertain that symptoms have occurred for at least 6 months, in at least 2 settings, and have interfered with the patient's normal function. Before establishing a diagnosis of ADHD, it is important to rule out other conditions which may result in the same behavioural symptoms, and direct treatment at those conditions. Treatment with stimulants, as well as behavioural therapy, should be initiated following the diagnosis of ADHD, with close monitoring for improvement and side effects.

References

References available upon request.