Attention-Deficit Hyperactivity Disorder and the Athlete: New Advances and Understanding

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• ADHD • Sports • Thermoregulation • Exercise physiology
• Drug therapy

In recent years there has been an apparent increase in the number of athletes arriving on college campuses with a diagnosis of attention-deficit/hyperactivity disorder (ADHD) and taking medication to treat the ADHD.[1] The active ingredients in these medications include the stimulants amphetamine and methylphenidate (MPH), which seem to have performance-enhancing activity. Furthermore, many athletes have the diagnosis of ADHD made after arriving on college campuses when they begin to struggle academically. Despite an incidence in the general population reported anywhere between 4% and 7%,[2] there seems to be a slightly increased incidence of ADHD in college athletes (Jesse W. Parr, personal observation, June 2, 2010). This brings up several questions[1]: is ADHD a legitimate, medically based condition about which clinicians should be concerned?[2] How is it possible that athletes with ADHD could make it to college and not be diagnosed previously if they really have ADHD?[3] Is the apparent increased incidence of ADHD among college athletes compared with the incidence in the general population legitimate?[4] What, if any, effect is there on sport performance from having a diagnosis of ADHD? And what, if any, effect is there on sport performance and/or thermoregulation from taking medicines used to treat ADHD.[5]

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THE NATIONAL COLLEGIATE ATHLETIC ASSOCIATION PERSPECTIVE

From the perspective of the National Collegiate Athletic Association (NCAA), the concern with medication for ADHD and sports competition results from the realization that, in recent years, the number of student athletes testing positive for these stimulant medications has increased threefold[1] and, in many cases, there has been inadequate documentation submitted in support of the request for a medical exception to the NCAA banned drug policy. The NCAA bans classes of drugs because they can harm student athletes or they can create an unfair advantage in competition, but some legitimate medications contain substances banned by the NCAA and student athletes may need to use these medicines to support their academics and their general health.

WHAT IS ADHD

The *Diagnostic and Statistical Manual, Fourth Edition* (DSM-IV),[3] of the American Psychiatric Association defines ADHD as a heterogeneous behavioral disorder with multiple possible causes, characterized by problems with inattention or impulsivity/overactivity, or both, causing impairment in all or most areas of life, and not better explained by another mental disorder (eg, autism or mental retardation), with onset in childhood, although symptoms may not be noticed or cause impairment until later in life. The course is persistent rather than episodic, and the characteristics may not always be impairing. Each of these points is discussed in more detail. In the past century, this condition has been called minimal brain damage (1930), hyperactive child syndrome, minimal brain dysfunction, hyperkinetic reaction of childhood, attention-deficit disorder (ADD) with or without hyperactivity, and now ADHD. All of these refer to the same condition.

A Heterogeneous Behavioral Disorder

The clinical characteristics of persons with ADHD vary greatly in character as well as severity, but are manifest as problems with behavior. These problems with behavior may involve difficulty with (1) academics; (2) compliance with scholastic, family, and societal rules; and (3) social relations with peers. The most recognizable symptoms are the overactivity and impulsivity displayed by children with ADHD, but difficulty with inattention is more academically impairing. Evidence is beginning to emerge that some persons with ADHD also have more difficulty with emotional regulation than control subjects.

Multiple Possible Causes

The most frequent cause is heredity, and ADHD is among the most hereditable disorders in humans, with 75% to 80% of its cause being genetic. Several genes involved in the manufacture, packaging, release, and reuptake of the neurotransmitters dopamine (DA) and norepinephrine (NE), as well as genes determining the receptors to these neurotransmitters, seem to be related to the cause of ADHD. The cause of the remainder involves either traumatic brain injury or perinatal events causing injury to the brain areas involved in executive functions.

Characterized by Problems with Inattention and/or Overactivity/Impulsivity

Although not present in all subjects with ADHD, the most recognizable behavioral characteristic is overactivity/impulsivity, most commonly referred to as hyperactivity. Impulsivity is a general tendency to speak and act without reflection on the appropriateness of the activity. These children are frequently referred to their physician early in