JOURNAL OF INSURANCE MEDICINE
Copyright © 2003 Journal of Insurance Medicine
J Insur Med 2003;35:51–56

CASE STUDY

Attention Deficit Hyperactivity Disorder (ADHD)—Life Insurance Implications

M. Jack Cotlar, MD

Attention deficit hyperactivity disorder (ADHD) is the most common neurobehavioral disorder in youth. About one-half of these youngsters continue to have symptoms as they enter their 20s. Of these, some also have co-morbid conditions such as conduct disorders, psychiatric problems and substance abuse. The medical director must be able to recognize the small subset of affected individuals whose mortality due to ADHD is greater than that of the standard population.

Address: 9200 Keystone Crossing, Suite 800, Indianapolis, IN 46240-4603.

Correspondent: M Jack Cotlar, MD, Amerus Life Insurance Group; e-mail:jack.cotlar@indianapolislife.com.

Key words: Mortality, ADHD, attention deficit, hyperactivity.

CASE PRESENTATION

The proposed insured is a 39-year-old man applying for $100,000 of life insurance. The application states that he is employed as a longshoreman, smokes cigarettes, and takes bupropion for ''nervousness.'' The exam shows his height to be 5 feet 10 inches and his weight to be 190 pounds. The heart rate and blood pressure are 96 beats per minute and 130/96 mm Hg, respectively. His lab work is normal except for a gamma glutamyltransferase (GGPT) of 99 U/L (normal: 2–65 U/L) and triglycerides of 290 mg/dL (normal: 80–200 mg/dL). The motor vehicle report shows driving while under the influence 2 years ago, 3 speeding tickets in the past 3 years, and 1 accident. The inspection report discloses ''occasional'' use of marijuana and ''social'' use of alcohol.

An attending physician statement (APS) is obtained. It includes the following details. The father of the proposed insured was an alcoholic. The proposed insured's first marriage ended in divorce. He was treated for ''situational depression'' because of 2 teenage children with behavior problems, difficulty holding down a job and marital discord. Also mentioned in the records were episodes of ''explosive anger,'' especially when driving. He had several arrests due to fighting. His physician prescribed bupropion to treat the depression and to help the proposed insured to discontinue smoking. The APS had no entries addressing the proposed insured's use of alcohol.

DISCUSSION

Attention deficit hyperactivity disorder (ADHD) is the most common neurobehavioral disorder presenting for treatment in youth with a prevalence estimated to be 4% to 5%. It is often associated with co-occurring anxiety, mood disorder, disruptive disorders and substance abuse. ADHD is often chronic with prominent symptoms and impairment spanning into adulthood.

ADHD, once thought to occur only in chil-

dren, is now known to persist into adulthood in up to 60% of cases with childhood onset. The ADHD diagnosis in the adult should include symptoms of inattention, distractibility and impulsive behavior. In addition, a childhood history of ADHD is a prerequisite for making the ADHD diagnosis in an adult.

Those suffering with this disorder are compromised in several areas including educational, social and occupational. It usually interferes with the ability to establish and maintain close relationships.

DIAGNOSIS

Accurate diagnosis of ADHD in adults is difficult. It requires attention to early development and symptoms of inattention, distractibility, impulsivity and emotional liability. Because of the overlap between the symptoms of adult ADHD and the symptoms of other common conditions, such as depression and substance abuse, making an accurate diagnosis is challenging. However, after a careful review of symptoms and impairment, the diagnosis of ADHD is both reliable and valid (Table 1).

The criteria in Table 1 emphasize both inattention and hyperactivity/impulsivity that best describe pediatric presentations. Adults are more likely to have a subtle clinical presentation. Pervasive features disrupting at least 2 domains of daily life (eg, school, work, family, peer relationships) include poor concentration, distractibility, elevated motor activity, and impulsivity. These symptoms should be persistently present since age 7. Although this longstanding clinical history may be difficult to elicit in adults, it is a key feature of the disorder.

There is a growing consensus that the central feature of ADHD is disinhibition. Those with ADHD have a pattern of immediate reaction to environmental demands rather than deferring action to a more appropriate time. Compared to children, hyperactivity is not overt in adults. The child who is always ''on the go'' may, in later years, have restlessness and chronically feel ''on edge.'' Over time, deficits in sustained attention and concentration are likely to become more apparent. This results in missed deadlines, forgotten appointments and social commitments. Completed work is frequently misplaced amid clutter. They may have difficulties with breaking down tasks or ideas into subparts. Adults with ADHD often appear frenzied. Friends and family report disorganization, and often the affected adults themselves express frustration over their chronic inability to organize and prioritize. Thus, important tasks are not completed while trivial distractions receive inordinate time. Impulsivity often results in socially inappropriate behavior (eg, blurting out thoughts that are rude or insulting).

The 3 commonly used self-report measures for ADHD are the Wender rating scale, the Copeland symptom checklist, and the Brown scale. These are screening tools, but are not adequate for diagnostic purposes.

BIOLOGY

The biological underpinning of this disorder is supported by the following:

- Clinical improvement with stimulants implying that there is dysfunction of catecholamine neurotransmission in those with ADHD
- Positron emission tomography (PET scanning) studies revealing reduced glucose metabolism in the basal ganglia and sometimes in the frontal cortex
- Excessive cortical slowing documented on the electroencephalogram
- Twin studies showing a familial, genetic influence

Castellanos and associates did serial MRI scanning over a 10-year period in children and adolescents with ADHD and in healthy controls.[2] They found that the initial brain volumes were smaller in all regions among those with ADHD (treated and untreated), and the longitudinal growth curves of most brain structures were parallel to those in the control group. The study gives additional support that genetic and/or early environ-

Table 1. Diagnostic Criteria for Attention-Deficit/Hyperactivity Disorder

A. Either (1) or (2):
   (1) Six (or more) of the following symptoms of inattention have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

   Inattention:

   a. Often fails to give close attention to details or makes careless mistakes in schoolwork, work, or 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 (not due to oppositional behavior or failure to understand instructions)
   e. Often has difficulty organizing tasks and activities
   f. Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)
   g. Often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools)
   h. Is often easily distracted by extraneous stimuli
   i. Is often forgetful in daily activities

   (2) Six (or more) of the following symptoms of hyperactivity-impulsivity have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

   Hyperactivity:

   a. Often fidgets with hands or feet or squirms in seat
   b. Often leaves seat in classroom or in other situations in which remaining seated is expected
   c. Often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)
   d. Often has difficulty playing or engaging in leisure activities quietly
   e. Is often ''on the go'' or often acts as if ''driven by a motor''
   f. Often talks excessively

   Impulsivity:

   g. Often blurts out answers before questions have been completed
   h. Often has difficulty awaiting turn
   i. Often interrupts or intrudes on others (e.g., butts into conversations or games)

B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age 7 years.
C. Some impairment from the symptoms is present in two or more settings (e.g., at school [or work] and at home).
D. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.
E. The symptoms do not occur exclusively during the course of a pervasive developmental disorder, schizophrenia, or other psychotic disorder and are not better accounted for by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, or a personality disorder).

Code based on type:

314.01 Attention-Deficit/Hyperactivity Disorder, Combined Type: if both Criteria A1 and A2 are met for the past 6 months

314.00 Attention-Deficit/Hyperactivity Disorder, Predominantly Inattentive Type: if Criterion A1 is met, but Criterion A2 is not met for the past 6 months

314.01 Attention-Deficit/Hyperactivity Disorder Predominantly Hyperactive-Impulsive type: if Criterion A2 is met, but Criterion A1 is not met for the past 6 months

Coding Note: For individuals (especially adolescents and adults) who currently have symptoms that no longer meet full criteria, ''In Partial Remission'' should be specified.

Reprinted with permission from the *Diagnostic and Statistical Manual of Mental Disorders,* 4th ed, text revision copyright 2000, American Psychiatric Association.

mental influences affects brain development. It also shows that stimulant treatment of ADHD does not cause these structural changes.

SUBTYPES

A study done by Murphy et al examined subtype differences in co-morbidity and in antisocial, educational, and treatment histories among young adults (ages 17–27) with ADHD.[11] Comparisons were made between ADHD Combined Type (ADHD-C) and Predominantly Inattentive Type (ADHD-I) relative to each other and to a community control group of 64 adults. Both ADHD groups had significantly less education, were less likely to have graduated from college, and were more likely to have received special educational placement in high school. Both groups were more liable to have dysthymia, alcohol dependence/abuse, cannabis dependence/abuse, and learning disorders than the control group. Both ADHD groups were more likely to have received psychiatric medication and other mental health services than the control adults. There were some differences between these 2 subgroups of ADHD. The C-type adults were more likely to have oppositional defiant disorder (an ongoing pattern of uncooperative, defiant and hostile behavior toward authority figures that seriously interferes with the individual's day-to-day functioning), to experience interpersonal hostility and paranoia, to have attempted suicide, and to have been arrested than the ADHD-I adults. These results imply that there is greater impulsivity associated with the ADHD-C subtype and that this subtype may predispose toward greater antisocial behavior and its consequences than does ADHD-I type in adults.

Richards et al studied differences between college students with high and low symptoms of ADHD.[14] The results indicated high ADHD symptom college students hold more anger and hostility, especially when driving. They are more aggressive and risky on the road and experience more crash-related outcomes. The college students with more symptoms of ADHD also displayed anger in other socially unacceptable ways.

SUBSTANCE ABUSE

There has been controversy about whether ADHD increases risks of developing substance use disorders (SUD). The evidence suggests that only in the presence of conduct disorder is ADHD associated with an increased risk of substance use problems in males. There is only limited evidence of the role of ADHD in the etiology of substance use disorders among females.

Conduct disorder describes a group of behavioral and emotional problems in children and adolescence. Those with this disorder have great difficulty following rules and behaving in a socially acceptable way. Other children, adults and social agencies often view them as ''bad'' or ''delinquent,'' rather than mentally ill.

Rates of ADHD and conduct disorder were higher among teenage boys abusing drugs compared with teenage girls who abused drugs. However, those teenage girls who abuse drugs had high rates of disruptive behavior disorders. Also, drug-abusing female adolescents are more likely to have a major depressive disorder compared with drug-abusing male adolescents. Both genders have the same prevalence of bipolar disorders.

TREATMENT

Pharmacotherapy is the primary mode of treatment. Stimulants such as dextroamphetamine and methylphenidate have been the most common drugs utilized. Each is available in immediate and longer duration versions. Other options include bupropion, modafinil, venlafaxine, tricyclic antidepressants, and guanfacine.

Methylphenidate (Ritalin) is the most widely prescribed medication for ADHD. There have been 4 recent studies that show that Adderall has some advantage over the standard-release form of methylphenidate. Although

small, both symptom measures and global ratings were favored with Adderall use.

Psychotherapy can help control impulsiveness, form more satisfactory relationships, and improve parenting skills. It also may help with problem solving and organizational skills. Hesslinger et al present a structured skill-training program that is designed for adults with ADHD.[7] It is based on the principles of cognitive-behavioral treatment for borderline personality disorder, but has been tailored to suit the special needs of adult patients with ADHD. Some of the elements of the program are chaos and control, emotion regulation, impulse control, stress management and self-respect.

ADHD is one of the most common comorbid diagnoses with psychoactive substance use disorder (PSUD), and it is important that efficacious psychotherapies are used to complement psychopharmacological and perhaps family therapy approaches.

The clinician's goal is to help patients integrate their understanding of difficulties stemming from both conditions. The rationale of treatment for this comorbid condition is to reduce and stop drug use to be able to more effectively use coping strategies for ADHD. The challenge in working with this population is that the coping strategies that patients need to learn to stop drug use are the same ones needed to overcome ADHD. Thus, these patients are starting treatment with overwhelming obstacles. Abstinence is the central focus of the initial treatment; however, the behavior that must be changed is very much associated with ADHD. Whether this problem should be addressed first is often dependent on the difficulties presented by the particular patient.

COURSE

Mannuzza et al traced the developmental course of ADHD from childhood to adulthood.[10] Many, but not all, found the road to be bumpy. In early and middle adolescence, relative deficits are seen in academic and social functioning. The symptoms of ADHD remain problematic in two-thirds to three-quarters of these children. Antisocial behaviors, in some cases amounting to conduct disorder, are common. About 40% of these children continue to have these same difficulties into the late teenage years. Deficits in academic and social domains, such as lower or failing grades, poor performance on standardized tests, lack of friends, and less adequate ratings in psychosocial adjustment, may continue. Between 25% and 33% have a diagnosed antisocial disorder, and 66% of these individuals are arrested at some time. Also, drug abuse is observed in a minority of these youths. Thus, the greatest risk factor for the development of antisocial behavior and substance abuse by the late teenage years is the maintenance of ADHD symptoms.

In their mid-20s, the individuals' dysfunctions may be apparent in these same areas. They have completed less schooling, hold lower-ranking occupations, and continue to suffer from poor self-esteem and social-skill deficits. Also, those with ongoing symptoms of ADHD exhibit an antisocial personality, and in some, a substance use disorder in adulthood. By their mid-20s, many have not outgrown all facets of their childhood syndrome. These relative deficits, however, are variable. Most of these individuals were gainfully employed. Also, some had achieved a higher-level education (eg, completed master's degree, enrolled in medical school) and achieved professional status (eg, accountant, stock broker). Two-thirds of these children showed no evidence of any mental disorder in adulthood.

Thus, although ADHD children, as a group, fare poorly compared with their non-ADHD counterparts, the childhood syndrome of ADHD does not necessarily preclude attaining higher education or successful vocational goals. Most children no longer exhibit clinically significant emotional or behavioral problems once they reach their mid-20s.

SUMMARY AND RISK ASSESSMENT

ADHD is a very common diagnosis in the pediatric population. Since about half of these

individuals continue to have this disorder as adults, the number of proposed insureds with ADHD is high. Individuals with ADHD without a co-existing conduct disorder are more likely to have standard mortality. However, if there is substance abuse, or if there is a conduct disorder in addition to the underlying ADHD, then mortality is likely to be greater than expected.

Our 39-year-old longshoreman was not diagnosed with ADHD. However, there are multiple factors that may lead one to conclude that he is at risk. His high-risk behavior places him in harms way in several areas of his life, which creates a ''quick death'' potential. The author would assess his mortality risk to be substantial.

REFERENCES

1. Aviram RB, Rhum M, Levin FR. Psychotherapy of adults with comorbid attention-deficit/hyperactivity disorder and psychoactive substance use disorder. *J Psychother Pract Res.* 2001;10(3):179–186.
2. Castellanos FX, Lee PP. Developmental Trajectories of Brain Volume Abnormalities in Children and Adolescents With Attention-Deficit/Hyperactivity Disorder. *JAMA.* 2002;288(14):1740–1748.
3. American Academy of Child and Adolescent Psychiatry. Conduct Disorder. No.33. *Facts for Families.* January 2000. Available at: http://www.aacap.org/publications/factsfam/conduct.htm.
4. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders.* 4th ed. Washington, DC: American Psychiatric Association; 2000.
5. Elliott H. Attention deficit hyperactivity disorder in adults: a guide for the primary care physician. *South Med J.* 2002;95(7):736–742.
6. Faraone SV, Biederman J, Roe C. Comparative Efficacy of Adderall and Methylphenidate in Attention-deficit/Hyperactivity Disorder: A Meta-Analysis. *Psychopharmacol.* 2002;22(5):468–473.
7. Hesslinger B, Tebartz Van Elst L, Nyberg E, et al. Psychotherapy of attention deficit hyperactivity disorder in adults. A pilot study using a structured skills training program. *Eur Arch Psychiatry Clin Neurosci.* 2002;252(4):177–184.
8. Latimer WW, Stone AL, Voight A, Winters KC, August GJ. Gender differences in psychiatric co-morbidity among adolescents with substance use disorders. *Exp Clin Psychopharmacol.* 2002;10(3):310–315.
9. Lynskey MT, Hall W. Attention deficit hyperactivity disorder and substance use disorders: Is there a causal link? *Addiction.* 2001;96(6):815–822.
10. Mannuzza S, Klein RG. Long-term prognosis in attention-deficit/hyperactivity disorder. *Child Adolesc Psychiatr Clin N Am.* 2000;9(3):711–726.
11. Murphy KR, Barkley RA, Bush T. Young adults with attention deficit hyperactivity disorder: subtype differences in co-morbidity, educational, and clinical history. *J Nerv Ment Dis.* 2002;190(3):147–157.
12. Pary R, Lewis S, Matuschka PR, Lippmann S. Attention-deficit/hyperactivity disorder: an update. *South Med J.* 2002;95(7):743–749.
13. Pary R, Lewis S, Matuschka PR, Rudzinskiy P, Safi M, Lippmann S. Attention deficit disorder in adults. *Ann Clin Psychiatry.* 2002;14(2):105–111.
14. Richards T, Deffenbacher J, Rosen L. Driving anger and other driving-related behaviors in high and low ADHD symptom college students. *J Atten Disord.* 2002;6(1):25–38.
15. Searight HR, Burke JM. Adult attention deficit hyperactivity disorder. *UpToDate.* 2002; 10.2.
16. Searight HR, Burke JM, Rottnek F. Adult ADHD: evaluation and treatment in family medicine. *Am Fam Physician.* 2000;62(9):2077–2092.
17. Wilens TE, Biederman J, Spencer TJ. Attention deficit/hyperactivity disorder across the lifespan. *Annu Rev Med.* 2002;53:113–131.