CME Information

CME Released: 04/12/2010 ; Valid for credit through 04/12/2011

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Target Audience

This activity is intended for psychiatrists, pediatricians, and other primary care providers including physicians, nurse practitioners, physician assistants, and pharmacists.

Goal

The goal of this activity is to identify and adequately treat adolescents and adults with ADHD in order to prevent impulsive, aggressive, and potentially violent criminal behavior, both in and out of prison.

Learning Objectives

Upon completion of this activity, participants will be able to:

1. Identify the civil and criminal justice consequences of untreated ADHD in children, adolescents, and adults
2. Formulate strategies to address aggressive behavior in individuals with ADHD inside and outside the criminal justice system

Credits Available

Physicians - maximum of 0.50 *AMA PRA Category 1 Credit(s)™*

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From Medscape Education Psychiatry & Mental Health

ADHD and Crime: Considering the Connections

Joel L. Young, MD

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Introduction

Jim, age 18, was just hanging out in the neighborhood with his younger cousin, when he happened upon a very hot-

looking red sports car a few blocks from home. Amazingly, the keys were in the ignition, seemingly just waiting for someone to come along. Without much thought, the adolescents jumped in the car and drove off. Several hours later, the very chagrined Jim was apprehended by the police, who were entirely unsympathetic to his explanation that he had just wanted to experience the ride; he didn't think it counted as *stealing*. The Court was also unconvinced, and although he had no prior criminal convictions, Jim was sentenced to 9 months in jail and 2 years probation.

As part of his sentence, the court demanded that Jim obtain a full mental health evaluation. The psychiatrist learned of Jim's chronic struggles, including poor school performance, intermittent marijuana use, and regular conflicts with authorities. After a thorough examination, the psychiatrist diagnosed attention-deficit/hyperactivity disorder (ADHD), predominantly hyperactive-impulsive type, and prescribed treatment. Within weeks, Jim noted improvements in his focus and concentration. Jim's family reported that he was decidedly less moody and impulsive. After a few months on treatment, Jim's gains solidified, and the family was convinced the intervention had averted further encounters with the criminal justice system. This case highlights the complicated relationship that individuals with ADHD have with their impulsivity and the criminal and societal implications of this disorder.

People with ADHD commit crimes for many of the same reasons as those without ADHD: Some want money or property that belongs to others and have little motivation to acquire the loot honestly. Those with ADHD also have other triggers for crimes; adolescents and adults with untreated ADHD are often bored, sensation seeking, or simply impulsive, and this combination of attributes leads them to react with poor judgment. A desired item appears, they want it, so they take it.[1] It also appears that when individuals with ADHD commit violent crimes, these acts are more likely to be crimes of spontaneous and "reactive" aggression rather than carefully plotted out offenses. Such crimes are generally impulsive acts driven by a provocation or conflict that triggers an outburst. Research with adult male offenders seems to bear out this hypothesis.[2]

Studies show that at least 25% of prisoners in the United States have ADHD. The recidivism rate among all felons is high, and an estimated two thirds are rearrested within about 3 years.[3] These statistics have important implications for society at large.

Why Should We Care About Untreated Criminals With ADHD?

ADHD among prisoners is a problem, not only for the offenders with ADHD but also for their victims who were misused violently and nonviolently. Evidence suggests that the diagnosis and treatment of ADHD could have an impact on crime rates. In 2009, the National Bureau of Economic Research[4] sought an explanation for a decline in violent crimes starting in the 1990s; they hypothesized that there was a relationship between the increase in prescribing of newer-generation antidepressants for depression (such as bupropion) and also in the prescribing of stimulants for ADHD.

The researchers compared the rates of prescriptions for these psychiatric medications to rates of violent crimes in the United States from 1997-2004 with a statistical regression analysis.[4] They found a significant inverse correlation; that is, as prescriptions went up, violent crimes came down. As a comparison, the authors also looked at the prescription rate of statins for cholesterol treatment and found no relationship between the number of prescriptions for statins and the crime rate.

The researchers stated, "Our evidence suggests that, in particular, sales of new-generation antidepressants and stimulants used to treat ADHD are negatively associated with rates of violent crime." They added, "To put this in perspective, doubling the prescription rate [of antidepressants] would reduce violent crimes by 6%, or by 27 crimes per 100,000, at the average rate of 446.5 crimes per 100,000 population. A similar calculation with stimulants would decrease crimes by a range of 30-38 crimes per 100,000. While doubling the prescription rates seems like a large change, it has been estimated that 28% of the US adult population in any year has a diagnosable mental or addictive disorder, yet only 8% seeks treatment."[4]

The researchers noted that the crime rate in Canada also fell during the same time period.[4] As in the United States, Canada was among the world leaders in treatment with new psychiatric medications. This finding asserts that identifying

and treating ADHD is a win-win situation: Individuals with the condition experience the benefit of treatment, and the public is less likely to become their victims.

Studies on ADHD and Criminal Behavior

In *ADHD in Adults: What the Science Says*,[5] Russell Barkley and colleagues report on the Milwaukee Study, a longitudinal outcome assessment of crime and other activities of hyperactive children through the life cycle. According to Barkley, there were too many medication variations to account for treatment, but the majority had not received medication treatment for their ADHD (Barkley RA, personal communication, 2008). The authors reported on 2 separate groups of adults with hyperactivity: those diagnosed with ADHD with hyperactivity as children (H+ADHD; n=55) and those not diagnosed with ADHD until adulthood (H-ADHD; n=80). These groups were compared with a community control group (n=73). In most cases, the 2 groups of adults with ADHD had significantly higher rates of crime than the community control group, although the H+ADHD group fared worse than both other groups in terms of stealing property, selling drugs, assaulting others, and several other categories. For example, 40% of the H+ADHD group had carried a weapon illegally, compared with 20% of the H-ADHD group and 8% of the control group. Among the H+ADHD group, 58% had ever been jailed, compared with 46% of the H-ADHD group and 24% of the control group (Table 1).[5] Clearly, ADHD is a factor in the commission of crimes.

Table 1. Crime Categories for Each Group in the Milwaukee Study

	H+ADHD (%) (n=55)	H-ADHD (%) (n=80)	Community (%) (n=73)	*P* Value
Stole others' property	74	58	45	.004
Stole others' money	47	42	28	NS
Robbed someone of money	7	2	1	NS
Breaking and entering	14	15	3	.021
Assaulted with fists	42	33	16	.004
Assaulted with a weapon	29	6	3	< .001
Set fires intentionally	11	9	5	NS
Carried a weapon illegally	40	20	8	< .001
Forced sexual activity	2	0	0	NS
Possessed illegal drugs	67	61	48	NS
Sold drugs illegally	40	27	19	.026
Engaged in disorderly conduct	47	34	24	.022
Arrested	73	52	33	< .001
Jailed	58	46	24	< .001

H+ADHD = adults diagnosed with ADHD with hyperactivity as children; H-ADHD = adults not diagnosed with ADHD until adulthood; NS = not significant

Adapted from Barkley RA, Murphy KR, Fischer M. *ADHD in Adults: What the Science Says.* New York, NY: Guilford Press; 2008:313.

In a study of 198 prisoners in a Scottish prison,[6] Young and colleagues found that 48 subjects (24%) met the criteria for childhood ADHD. Of these 48 prisoners, 11 (23%) still exhibited fully active ADHD symptoms as adults, while 16 (33%) had partial symptoms. Thus, 55% (27 inmates) had identifiable symptoms of ADHD that persisted from their childhood into adulthood. The researchers found that these 27 prisoners with continued ADHD symptoms had perpetrated significantly more aggressive incidents than the other prisoners.[6] Nonsymptomatic prisoners averaged 0.46 acts of physical aggression compared with 2.48 incidents among those with ADHD symptoms. The symptomatic group was also more verbally aggressive and was responsible for more incidents of property damage (Table 2). The researchers noted that the severity of aggression was nearly 12 times greater for the ADHD group.[6]

Of interest, adults in the ADHD group appeared to externalize their anger and were less likely to be self-injurious than their non-ADHD cohorts. The study did not control for treatment, and it is unknown if appropriate intervention could have altered the findings.

Table 2. Means, Standard Deviations, Medians, and Range of Scores for Critical Incidents Within the Prison for the Nonsymptomatic and the ADHD Symptomatic Group

Critical Incidents	Nonsymptomatic Group (n=171)				Symptomatic Group (n=27)			
	Mean No. of Incidents	SD	Median No. of Incidents	Range	Mean No. of Incidents	SD	Median No. of Incidents	Range
Verbal aggression	5.05	13.2	1.00	0-90	18.26	28.1	4.00	0-100
Physical aggression	0.46	0.95	0.00	0-6	2.48	5.8	1.00	0-30
Damage to property	0.39	1.2	0.00	0-7	1.59	4.7	0.00	0-20
Self-injury	0.09	0.55	0.00	0-5	0.15	0.4	0.00	0-1
Total critical incidents	6.41	13.9	2.00	0-95	23.5	33.8	8.00	0-120
Severity of aggression	0.68	1.5	0.00	0-10	4.7	12.1	1.00	0-62

SD = standard deviation

Adapted with permission from Young S, et al. *Personality Individual Differences.* 2009;46:267.[6]

Adolescents and Children and Criminal Acts

Children and adolescents derive their self-esteem through succeeding in school and pleasing the adults around them. Children with ADHD are struggling with chronic symptoms of inattention, distractibility, hyperactivity, and impulsivity and frequently do not realize this satisfaction. They can become alienated or friendless, and to avoid this outcome, they learn that outlandish behavior can earn them the respect of their peers. To them, negative attention is more desirable than no attention whatsoever, and befriending "bad kids" is preferable to having no friends.

Punishment for impulsive and criminal actions can begin a cascade of decline. A young offender's introduction to the juvenile justice system exposes them to increasingly troubled adolescents who can readily offer further education about wayward activities. Preventing this destructive cycle is the fundamental reason for early identification and treatment of this population.

ADHD That Persists Into Adulthood

Until recently, ADHD was thought to be "outgrown" by the time children reached adulthood; we now know that for many, ADHD symptoms persist. Indeed, the National Comorbidity Survey Replication found that 4.4% of American adults have ADHD.[7]

In a longitudinal study, Mannuzza and colleagues[8] studied 207 white boys (ages 6-12 years) with ADHD.[8] Follow-up visits were obtained at ages 18, 25, and 38 years. The analysis compared subjects with ADHD vs non-ADHD probands, revealing trouble for the afflicted group. Men with ADHD were nearly twice as likely to have been arrested (47% for the ADHD subjects vs 24% for the probands) and more than 3 times more likely to be convicted for crimes (42% for the men with ADHD vs 14% for the probands). Their rates of incarceration (15% vs 1%) were also pronounced.[8]

Mannuzza reported other disturbing trends. Seventeen percent of the men with ADHD had committed aggressive violent offenses such as murder, rape, robbery, and arson whereas none of the probands had committed any violent acts. Given the long duration of the study, the researchers were unable to control for treatment exposure.

In a retrospective study of more than 14,000 subjects with ADHD,[9] Fletcher and Wolfe analyzed the relationship between childhood ADHD and the commission of crimes in adulthood. The previous treatment status of the subjects, now young adults ages 18-28, was not known. Subjects were separated into the 3 subtypes of ADHD: hyperactive, inattentive, and combined. The findings were clear: compared with the general non-ADHD population, the likelihood of committing any crime was 11 points higher for those with hyperactive ADHD, 6.5 points higher for those with inattentive ADHD, and 5 points higher for those with the combined subtype.[9]

ADHD symptoms presenting early in life carry an ominous prognosis. Individuals with ADHD symptoms evident between ages 5 and 12 years, regardless of subtype, were significantly more likely to engage in criminal activities as adults compared with those without ADHD.[9] Individuals with the hyperactive subtype were the most likely to be arrested and convicted of a crime.[9] Robbery and theft were associated with this subtype. By contrast, those with the inattentive subtype of ADHD were more likely than those without ADHD to commit crimes that required planning, such as burglary or selling drugs. For unknown reasons, individuals with the combined subtype had the weakest links to adult criminal behavior.[9]

Female Criminals With ADHD

The prevalence of ADHD among incarcerated men and women far exceeds the rates among men and women in the general population. A study of 320 prisoners in Iowa found that 14.3% of the female prisoners and 23.1% of the male prisoners met the diagnostic criteria for ADHD.[10]

In an analysis of 110 female offenders with ADHD in a German prison,[11] Rösler and colleagues found a 24.5% lifetime prevalence of ADHD and a 10% prevalence of persistent ADHD. The inmates with ADHD were significantly younger at their first conviction (19.2 years, compared with 27 years for the non-ADHD women). In addition, the rate of diagnosis of ADHD was higher with younger age; for example, the prevalence of ADHD was 17.9% among the female inmates ages 25 and below and fell to just 10% among inmates ages 26-45 years.[11] Why the older inmates were less symptomatic is unclear. Perhaps they were more experienced at dealing with their symptoms.

Implications for Mental Health Professionals

The presumption that treatment for ADHD will positively affect outcomes drives clinicians to address this population. In a meta-analysis of studies of adolescents followed for 4 years,[12] Wilens and colleagues showed that treating adolescents with ADHD with methylphenidate significantly reduced their risk of developing a substance use disorder. Similar data regarding risk reduction are sparse in the ADHD/crime literature, but some preliminary findings are encouraging.

A Norwegian study of adults with ADHD determined the subjects' "index of burden" (IOB).[13] The IOB is a composite of scores evaluating alcohol abuse, substance abuse, criminality, and other items. Stimulant treatment in childhood and adolescence was found to contribute significantly to a higher level of psychological and social functioning in adulthood.

For example, 48% of the group that had received treatment had a 0 score on the IOB (lower scores are better). This compares favorably with the 18% of the untreated group that scored 0. This trend continues if criminality is assessed alone. Two out of 14 of the treatment group (14%) had criminal records, compared with 14 out of 59 of the nontreatment group (24%).[13]

The Need for Continued Treatment of ADHD

While the need for chronic treatment is apparent, many factors contribute to the fall off in treatment rates as patients age. Adolescents often lack the ability to assess the positive impact that treatment offers, and they tend to devalue parental input. Adolescents and young adults have less contact with their pediatricians and suffer from this professional void. As the individual transitions into the third and fourth decades of life, Medicaid and private insurance benefits are less well-protected, and cost becomes an obstacle to access to ADHD medications and treatment. All evidence suggests that the absence of treatment is correlated with increased rates of criminal behavior.[5,6,8-10] These findings have clear implications for public policy makers interested in criminality.

Our collective ambivalence extends to the issue of how to treat incarcerated individuals with ADHD. Prison officials may find it logically inconsistent that, on one hand, some prisoners are incarcerated for their misuse of addictive or illicit substances while, on the other hand, controlled agents are indicated for ADHD treatment. Despite this inherent paradox, more prison officials are recognizing the importance of treatment, if for no other reason than maintaining calm among closely quartered, impulsive inmates. The introduction of the nonstimulant atomoxetine, a US Food and Drug Administration-approved agent for treating adult ADHD,[14] has also been helpful. The long-acting OROS (osmotic-release oral system) methylphenidate also has a low risk for abuse.[15] Most recently, the introduction of the pro-drug lisdexamfetamine offers an effective, long-acting amphetamine that is activated after absorption in the gastrointestinal tract and has little potential for nasal or intravenous abuse.[16] These novel agents and delivery systems significantly reduce the risk for stimulant misuse.

Conclusion

ADHD is a significant factor relating to both crime and punishment. The condition increases the risk of committing a crime, and once the individual is incarcerated, the conundrum develops regarding appropriate treatment. Evidence suggests that proper treatment may reduce the risk for criminal behavior and the rate of recidivism among afflicted criminals.

Coherent approaches to treating youth with ADHD both in and out of the criminal justice system need to be developed. Additional study will further enlighten these difficult issues. For the present, it is important for psychiatrists to consider ADHD as a valid factor in crime and the treatment of ADHD as a potentially preventive measure against the commission of violent and nonviolent criminal acts. Resolving or improving ADHD symptoms can bring relief to the individual as well as to society at large.

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