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Attention Deficit Hyperactivity Disorder and Males in the Juvenile Justice System

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1. Introduction

Attention Deficit Hyperactivity Disorder (ADHD), a neurodevelopmental disorder of self-control/self-regulation characterized by developmentally inappropriate and impairing levels of inattention and hyperactivity-impulsivity (Barkley, 2006), is a major risk factor in the developmental sequence that results in serious antisocial behavior. Consequently, it is widely prevalent in the juvenile justice system and should be included in every mental health screening that should take place when a juvenile becomes involved with the system as well as treatment planning. The objective of this chapter is to present the empirical support for these contentions for male juvenile offenders. The focus is restricted to males since, although the correlates of antisocial behavior in male and females have typically been found to be the same (Lahey et al., 2006; Odgers et al., 2008), the literature on females is slight compared to that of males and thus problematic with regard to the reliability of the findings.

2. ADHD and increased risk for severe antisocial behavior

Severe antisocial behavior is legally designated, delinquency, when it refers to behavior that violates criminal law and psychiatrically designated, conduct disorder (CD), when it refers to a repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate societal norms are violated (Farrington, 2009). There is strong empirical support establishing a robust association between ADHD and increased risk for the development of severe antisocial behavior defined either legally or psychiatrically.

With regard to legally defined antisocial behavior, clinical studies of children diagnosed with ADHD and followed-up into adolescence and early adulthood have consistently found higher rates of delinquent behavior. Mannuzza et al. (1989) compared arrest rates in 103 adolescent ADHD subjects and 100 normal controls (mean age of 18 years for both groups). Significantly more hyperactive than control subjects had been arrested for any offense (39% versus 20%), convicted for any offense (28% versus 11%), arrested for a felony offense (25% versus 7%), and incarcerated (9% versus 1%). Satterfield et al. (1982) reported an 8-year follow-up (mean age of 17 years) of 110 ADHD adolescents. The percentage of these

subjects arrested at least once for a serious offense in the lower, middle, and upper socioeconomic classes was 58%, 36%, and 52% compared with 11%, 9%, and 2% for the controls. Barkley et al. (2004) compared the arrest rates of 147 ADHD and 73 control children (mean age 20-21). Those with ADHD had a greater rate of official arrests for misdemeanor (24% versus 11%) and for felony (27% versus 11%) offenses. Molina et al. (2009) in the landmark clinical Multisite Multimodal Treatment Study of children with ADHD (MTA) which had the largest clinical sample to date of children with ADHD (n=436), reported that at ages 13-18 approximately 25% to 30% of the youths were in the spectrum of clinically serious antisocial behavior, 26.8% were arrested at least once by 8 years, and 30% had engaged in moderately serious to serious delinquent behavior according to youth or parent report. All these outcomes were significantly higher than the control group, and the increased risk for serious antisocial behavior also characterized the group of children who had received 14 months of intensive state-of-the-art combination of behavior therapy and medication management. Moreover, these findings most probably underestimated the magnitude of the risk of the development of serious antisocial behavior associated with ADHD for two reasons. First, the children who were lost to follow-up tended to come from demographically disadvantaged families and thus at greater risk for antisocial behavior than those who remained in the study (Molina et al., 2009). Second, because at the time of the follow up most children had not entered late adolescence, the peak period for antisocial behavior (Tremblay, 2010), the difference in risk between the two groups again is most probably an underestimate. Lastly, Bussing et al. (2010) in a large epidemiological study, screened a school district sample of 1,625 students aged 5 to 11 years for ADHD. The 94 youth diagnosed with ADHD were followed up 8 years later and compared to matched case controls. Children with ADHD were three times more likely to be involved with the juvenile justice system based upon parental report than case controls (19% vs. 6%). Furthermore, because as with the Molina et al. study (2009), most children had not entered the peak period for antisocial behavior at the 8 year follow-up, the difference in risk for involvement in the juvenile justice system between the two groups is most probably an underestimate.

With regard to psychiatrically defined antisocial behaviour, numerous clinical studies of child onset cases of CD, which represent more severe cases of CD and thus are most similar to delinquent youth, there is the striking finding that the vast majority of males with CD are comorbid for ADHD (Beauchaine, Hinshaw, & Pang, 2010; Frick & Moffitt, 2010; Lahey, Loeber, Burke, & Applegate, 2005; Klein et al., 1997; McMahon & Frick, 2007).

In summary, given the very strong association between ADHD and the risk of developing severe antisocial behavior, it would seem that its role as a causal risk factor for this development is secure. However, there is significant controversy over the role ADHD plays in the development of CD and delinquency because of the failure to take into account oppositional defiant behavior (ODD) [Burke, Waldman, & Lahey, 2010]. Namely, although developmental pathway theories of serious antisocial behavior commonly posit ADHD as the first step in the sequence, followed by ODD, with more severe CD behaviors emerging later (Frick & Marsee, 2006; Waschbusch, 2002), ADHD is rejected as a direct developmental precursor to CD because it does not consistently predict CD if prior ODD is taken into account (Burke, Waldman, & Lahey, 2010; Loeber, Burke, & Pardini, 2009). This issue will be addressed by first examining the role of ODD in the development of CD.

3. ODD as a developmental precursor to CD

The essential features of ODD are a recurrent pattern of negativistic, defiant, disobedient, and hostile behavior toward authority figures, which leads to impairment (APA, 2000). Its role as a developmental precursor to CD has been well documented (Frick & Marsee, 2006; Lahey, Loeber, Burke, & Applegate, 2005; Moffitt et al., 2008). Moreover, it is now understood that far from being simply a benign, milder form of CD, ODD plays a key role in the development of CD and is one of the strongest predictors of the onset of CD and of the course of CD symptoms over time (Loeber, Burke, & Pardini, 2009). And, although the majority of children with ODD do not go on to develop CD (Loeber, Burke, & Pardini, 2009), if childhood onset CD develops, it is almost always preceded developmentally by ODD (Burke, Waldman, & Lahey, 2010). This development is likely to occur when social contexts (e.g., family and peer environment) increase rather than decrease the antisocial propensity of ADHD/ODD (Dick, 2011; Lahey & Waldman, 2008; Meier et al., 2008; Murray & Farrington, 2010). In addition, there is emerging evidence that there are subdimensions of ODD symptomatology that are not equally associated with the risk of developing CD (Pardini, Moffitt, & Frick, 2010; Rowe et al., 2010). The symptoms that index a negative affect dimension predict internalizing problems whereas oppositional symptoms such as *often argues with adults, often actively defies or refuses to comply with adult's requests or rules*, which index a "headstrong" dimension, predict CD (Rowe et al., 2010; Stringaris & Goodman, 2009). The "headstrong" dimension of ODD has been found to be associated with ADHD (Stringaris & Goodman, 2009) and thus provides an apt segue to consider the role of ADHD in the development of ODD.

4. ADHD and ODD

ODD is the most common comorbid condition of ADHD in children and studies of clinic-referred ADHD children find that between 54% and 67% will meet criteria for a diagnosis of ODD by 7 years of age or later (Barkley, 2006). This comorbidity is best explained by the core impairments of behavioral and emotional impulsivity in ADHD (Barkley, 2006, 2010a, 2010b). Although it is without question that behavioral impulsivity is a core impairment in ADHD Combined Type (ADHD-C), and is receiving even more emphasis in the proposed change for DSM 5 to add four more symptoms of impulsivity (Castellanos, 2010), it is only recently that emotional impulsivity/dysregulation has also been recognized as a core ADHD impairment (Barkley, 2010a, 2010b). These twin impairments commonly result in symptoms such as irritability, impatience, anger, low frustration threshold, and reactive aggression (Barkley, 2010a; Frick & Viding, 2009) which greatly increase the risk for coercive, oppositional interchanges (Barkley, 2006; Burns & Walsh, 2002; Lahey & Waldman, 2008; van Lier, van der Ende, Koot, & Verhulst, 2007). Indeed, it is estimated that a typical child with ADHD has an astonishing half a million of these negative interchanges each year (Pelham & Fabiano, 2008), thereby adding impressive support to Barkley's judgment (2010a) that having ADHD-C virtually creates a borderline case of ODD in children.

Finally, perhaps the most persuasive evidence that because ADHD is a disorder of impaired self-control/self-regulation it increases the risk for ODD and thereby increases the risk for CD, comes from the most recent findings of the landmark Dunedin Multidisciplinary Health and Development study (Moffitt, Arseneault, Belsky, et al., 2011). This longitudinal study, which has followed a complete birth cohort of 1,037 children from birth to age 32, found that

self control assessed at age 3 predicted criminal offending at age 32. When the sample was segmented into the highest and lowest fifths on preschool self control, the lowest fifth had much higher crime conviction rates than the highest fifth: 43% vs. 13%. Since the measures used to assess self-control were essentially measures of the core features of the behavioral and emotional impulsivity that characterize ADHD-C (hyperactivity, impulsivity, inattention, lack of persistence, impulsive aggression, low frustration tolerance) in effect what the study found was that preschool children with many symptoms of ADHD (although they were not formally diagnosed as such in the study) were at high risk for criminality compared to those with good self-control. Thus impressive support has been added to the consensus that "Self-control theory is one of the most thoroughly researched and cited theories of deviance, delinquency, and crime" (Vaszosnyi & Huang, 2010, p.245) and that impulsivity is the most crucial variable that predicts antisocial behavior (Farrington, 2009).

In conclusion, there is mountainous evidence that ADHD indirectly increases the risk for early onset CD by greatly increasing the risk for ODD. This developmental sequence explains the robust consensus that "ADHD symptoms appear to be nearly ubiquitous among clinic-referred boys who meet diagnostic criteria for CD at 7-12 years of age" (Lahey, Loeber, Burke, & Applegate, 2005, p. 396).

5. CD Comorbid with ADHD

Although ADHD is a major risk factor for the development of serious antisocial behavior such as CD or delinquency, these ominous developments only occur in a minority of those with ADHD/ODD (as previously discussed) when social contexts (e.g., family and peer environment) increase rather than decrease the antisocial propensity. If this development occurs however, juveniles who are comorbid for CD and ADHD display a more pernicious form of antisocial behavior than those with a single disorder in terms of a greater range, severity, and persistence of antisocial activity and greater academic impairment (Barkley, 2006;). For example, although over half of the cases with child onset CD do not persist into adult life, such persistence is much more likely if the CD is comorbid with ADHD (Rutter, 2011). Similarly, delinquents with ADHD, in comparison to delinquents without ADHD, have earlier and more frequent involvement with the criminal justice system and a greater frequency and severity of aggression when incarcerated (Young & Goodwin, 2010).

6. Prevalence of ADHD in the juvenile criminal justice system

Since the vast majority of males with severe, child onset CD are comorbid for ADHD (Beauchaine, Hinshaw, & Pang, 2010), it logically follows that ADHD should be widely prevalent in the juvenile justice system. This indeed is the case as the following two types of research studies conducted in the United States have found.

First, prevalence of ADHD has been estimated from diagnoses made prior to juveniles involvement with justice system. Individual education plans (IEP) indicate that 28% of juveniles enter the correctional system with a prior diagnosis of ADHD (Tudisco, 2006). Note that IEP data underestimates the true prevalence of ADHD since it does not include those juveniles who either have a prior diagnosis of ADHD that is not included in the IEP or are undiagnosed.

Secondly, prevalence of ADHD is estimated through assessments when the juvenile is in the justice system using a variety of self-report methods. Earlier narrative reviews of these studies reported estimates ranging from 20% to 72% (American Academy of Pediatrics, 2001; Vermeiren, 2003). A more recent narrative review of 17 studies of incarcerated, detained, & secured juvenile populations from 1990 to 2003 reported the following rates for males: a) age 13 and younger -12.5%, b) ages 14-15 - 20.9%, c) ages 16 and older - 13.8% (Templin et al., 2006). A meta-analytic review of 13 studies of adolescents in detention or correction facilities reported an average rate of 11.7% for males (Fazel, Doll, & Langstrom, 2008).

Lastly, Washburn et al. (2007) reported rates of 17.1% for males in 1,829 randomly selected youths in the Cook County temporary juvenile detention center in Chicago, IL. This study will assume special importance in interpreting the various foregoing estimates because it is the single best study to date as its large sample of 1,829 randomly selected youths is most representative of the entire country for the following reasons: a) most juvenile detainees nationwide live in or are detained in urban areas, b) Cook County is racially/ethnically diverse, c) the juvenile system in Cook County is typical of most other states, and d) the gender, age, and offense distributions in the detention center are similar to those detained nationwide (Washburn et al., 2007).

Given the wide range of estimates, what is the best estimate and why? Before the question can be answered, it must be noted that all of the studies which estimate ADHD prevalence in the correctional system have two serious limitations. First, the ADHD diagnosis is based exclusively on self-report. Since accurate diagnosis requires information from significant others such as parents and teachers, the failure to include such information results in under diagnosis (Barkley, 2006; Barkley, Murphy, & Fischer, 2008). For example, Young et al. (2010) conducted a study to determine the most reliable source of information of ADHD symptoms by comparing rating scales scored by 54 male delinquents who were detained in a high risk care home and their teachers with psychiatric diagnosis of ADHD made by a professional clinical assessment. Sensitivity rates were 33% for delinquent self report compared to 67% for teacher report. Additional clear and convincing evidence that substantial underdiagnosis has indeed occurred in studies of the prevalence of ADHD delinquents comes from the previously discussed numerous clinical studies of juveniles who, having been diagnosed CD, were also assessed for ADHD using information from parents and teachers. In these studies, as previously discussed, the vast majority of those with CD were also diagnosed with ADHD. If this finding is applied to the 53% of males and females in detention or incarceration who have CD (Washburn et al., 2007) [note that 53% is an underestimate as it is based on self-report], then the vast majority of the 53% with CD would also presumably be diagnosed with ADHD if they were properly evaluated. Second, all studies that have assessed for ADHD in adolescents in all settings suffer from another limitation that results in an underestimation of true prevalence. Namely, these measures are based upon developmental manifestations of ADHD in children which become increasing irrelevant to the subsequent developmental manifestations of ADHD at subsequent ages (Barkley, 2010c; Barkley, Murphy, & Fischer, 2008; Kessler et al., 2010; Malone et al., 2010). For example, child criteria emphasize overt hyperactivity which diminishes with age and many of the criteria that index symptoms of inattention in childhood are less relevant to subsequent manifestations of inattention (Barkley, Murphy, & Fischer, 2008; Kessler et al., 2010).

In summary, if approximately 28% of those who enter the juvenile justice system have a prior formal diagnosis of ADHD, if the vast majority of 53% plus of juveniles in the system with CD would also be diagnosed with ADHD (if they were properly assessed), if the reported rates of 17.1% for males in the best study to date (Washburn et al., 2007) are an underestimate because of the inadequacies of assessment for ADHD, then a conservative prevalence estimate of 25% would seem to be reasonable.

6.1 International studies

Studies in countries other than the United States (Canada, Sweden, Finland, Norway, and the United Kingdom) reported an ADHD prevalence rate averaging 45% among juveniles in the correctional system (Young & Goodwin, 2010; Young et al., 2011). These findings provide strong confirmation that the 25% prevalence rate in the United States is indeed a conservative estimate. In addition, the 20% difference in the prevalence rates may in fact represent a real difference that cannot simply be attributed to methodological variance. For example, it may be that more of the delinquency in the United States is due to cultural pathologies, e.g. gang affiliation (Farrington, 2009), whereas proportionately more of the delinquency in other countries is due to individual pathologies such as ADHD.

6.2 Conclusion

There is no doubt that the international scientific literature has found that ADHD is widely prevalent in the juvenile justice system in virtually all countries that have been studied. Furthermore, it is quite striking that this prevalence is vastly disproportionate to what would be expected based upon population rates. Though population prevalence rates vary widely because of methodological rather than true differences (National Institute for Health and Clinical Excellence, 2009), a systematic review of international prevalence studies by Polanczyk et al. (2007), after correcting for methodological variance, found only minor differences in different countries and reported an average rate of about around 5.3%. Since this rate blends male and female rates and since the male rate in epidemiological studies is about 2 to 3 times higher (Barkley, 2006), a rough international estimate would yield a male rate of 7% and female rate of 3%. Thus the prevalence rate of ADHD among male juvenile offenders is at least 4 times more common than what would be expected from the population rate. This widespread prevalence of ADHD among male juvenile offenders makes it imperative that every mental health screening that should take place when a juvenile becomes involved with the justice system should screen for ADHD. The 25% to 45% of the individuals who can be expected to be diagnosed with ADHD receive competent treatment for this disorder, as well as for whatever other disorders might be comorbid with the ADHD.

7. Screening for ADHD

The awareness that the mental health needs of many youth in the juvenile justice system are unmet has led to the development of systematic mental health screening tools in an effort to better identify and respond to these youth (Skowyra & Coccozza, 2007). However, to judge from the most widely used screening tool in juvenile justice, the *Massachusetts Youth Screening Instrument, 2nd Version (MAYSI-2)* [Skowyra & Coccozza, 2007], these tools fail to adequately screen for ADHD. Hence the mental health needs of the 25% to 45% of youth in

the justice system with ADHD are not met. If these needs are to be met, the following screening recommendations for ADHD are suggested.

7.1 Screening recommendations

Mental health screening is a relatively brief process performed by non-clinical staff using a standardized screening instrument which may result in a follow-up comprehensive clinical assessment for youth whose scores indicate they may have mental health problems (Williams, 2007). One way in which screening for ADHD could be incorporated into a standard mental health screening would be to add an ADHD screening module to the most widely used screening tool in juvenile justice, the *Massachusetts Youth Screening Instrument, 2nd Version (MAYSI-2)*. Such a module should include the following elements.

1. *Carefully review existing documentation.*

Examine all of the juvenile's existing documentation to see if it includes a prior diagnosis of ADHD in childhood. If it does, a referral for a more comprehensive confirmatory evaluation is warranted since most children diagnosed with ADHD continue to have the disorder into adolescence (Barkley, 2006).

2. *Screen for self-reported attention problems.*

Attention problems are the single most important symptom cluster for identifying ADHD beyond childhood (Barkley, 2010c; Barkley, Murphy & Fischer, 2008). The following questions have been found to be the most sensitive indicators of these problems (Barkley, 2010c; Barkley, Murphy & Fischer, 2008; Keller et al., 2010).

- *Are you easily distracted?*
- *Do you have difficulty sustaining attention?*
- *Do you have difficulty prioritizing work?*
- *Do you have trouble planning ahead?*
- *Do you have difficulty completing tasks on time?*

If the individual indicates that these problems occur often or very often, this is indicative of ADHD (Barkley, 2010c) and warrants referral for a more comprehensive confirmatory evaluation.

8. Treatment

The following treatment recommendations are based upon the consensus statement of the United Kingdom ADHD network and criminal justice agencies for the management of juvenile offenders with ADHD (Young et al., 2011). For whichever stage an offender is at (police, court, probation, parole, prison) a protocol should be established for insuring that intervention meets the needs of offenders with ADHD. This protocol should have three broad aspects:

1. Pharmacological treatment to alleviate ADHD symptoms.
2. Psychological treatment to improve self-control, reduce antisocial attitudes and behaviors, and treat comorbid disorders.
3. Integration of care pathways.

8.1 Pharmacological treatment

An extensive literature has clearly documented the robust short-term efficacy (2-8 weeks) of stimulant treatment for core ADHD symptoms of inattention, impulsivity and hyperactivity for school-age Caucasian boys (Biederman & Spencer, 2008; Connor, 2006). These studies have also found that the core symptoms of ADHD in children with ADHD and ODD/CD respond as well to stimulant treatment as symptoms in children with ADHD alone (Pliszka, 2009). The effect size of the response of stimulants relative to placebo (response to which is generally low, e.g., 13%) is close to 1.0 thereby making stimulants among the most efficacious medications in all of health care, rivaling the antibiotics in this regard (Pliszka, 2009).

Stimulants also have similarly robust effects on oppositional/defiant behaviors and overt aggression (Connor 2006; Connor et al., 2002; Pliszka, 2009), especially when an optimal medication regimen is combined with behavior therapy (Blader et al., 2010). Perhaps the best indication of the efficacy of treating children comorbid for ADHD/ODD comes from the largest randomized control study to date, the Multimodal Treatment Study of ADHD, in which 40% of the participants had ODD or CD (Smith, Barkley, Shapiro, 2006). Fourteen months of combined stimulant and behavior treatment resulted in a success rate of 68% (defined as an excellent response such that functioning was in the normal range, i.e., no or almost no symptoms of ADHD or ODD) in contrast to a 25% success rate for the community comparison group (Swanson et al., 2001).

8.1.1 Potential for abuse of stimulant medication

The delivery of stimulant medication in a prison setting should not be a problem since these settings typically already run medication-based programs for controlled drugs and successfully adhere to policies that reduce the chances of mismanagement (Young et al., 2011).

The potential for abuse of stimulant medication that is delivered in other settings can be reduced in three ways. First, the most conservative approach would be to use a non-stimulant medication such as atomoxetine. This approach however suffers from the limitation that it is less effective than the stimulants (Faraone, 2009; Young et al., 2011). Second, stimulant medications can be used that are less vulnerable to abuse. Prodrug or long acting formulations can be used, as they are less easily manipulated than immediate release formulations (Kollins, 2008). Also delivery systems such as the crush resistant shell of Concerta or a methylphenidate skin patch can be used (Mariani & Levin, 2007). Third, there should be careful monitoring for signs of possible abuse or diversion such as missed appointments, repeated requests for higher doses or a pattern of 'lost' prescriptions (Kollins, 2008).

8.2 Psychological treatments

Stimulant treatment should always form part of a comprehensive treatment plan that includes psychological, behavioral, and educational interventions (Young et al., 2011). Specific programs have been developed that integrate stimulant treatment with non-

pharmacological treatments for ADHD that enhance the efficacy of medication and also treat comorbid problems (Young & Amarasinghe, 2010).¹ Furthermore, these combined treatments can improve adherence to whatever offender programs the correctional system offers (Young et al., 2011).

8.3 Integration of care pathways

It is critical to establish a continuous, integrated care pathway that follows the offender from initial police contact through to eventual disposition (Young et al., 2011). An adequate knowledge of ADHD throughout the whole care pathway is critical in helping ADHD offenders rehabilitate. Most importantly, there must be community services to support ADHD offenders in implementing this continuity of care.

9. Conclusion

ADHD is a major risk factor for the development of male juvenile antisocial behavior. This risk results in a conservatively estimated international ADHD prevalence rate of 25% to 45% of males in juvenile correctional systems. Therefore, given this widespread prevalence, it follows that an adequate understanding of ADHD must exist at every stage of the offender pathway from initial police contact to eventual disposition. Screening for ADHD must be implemented in all criminal justice services. Having identified ADHD in an offender, appropriate treatment needs to be implemented in an integrated fashion throughout the care pathway.

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¹ As it is beyond the scope of this chapter to discuss the specific programs, this article should be consulted as it provides an excellent review which details recommended interventions, the level of evidence on which the recommendation is based, and a brief description of techniques employed.

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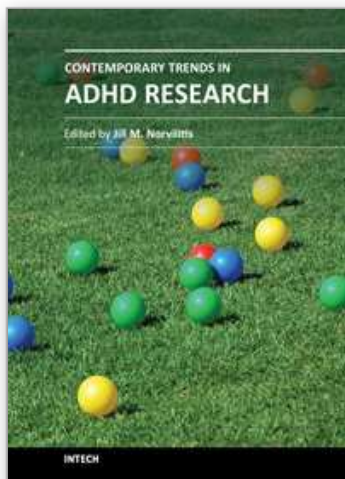
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With many children and adults affected by Attention Deficit Hyperactivity Disorder, researchers strive to understand the underpinnings of ADHD and associated factors on both a basic and applied level. The goal of this volume is to explore some of the broad array of research in the field of ADHD. The 12 chapters cover a variety of topics as varied as postural control, endocrine dysfunction, juvenile justice, and academic outcomes. These chapters will provide valuable insights for students reading about ADHD for the first time, researchers wishing to learn about the latest advances, and practitioners seeking new insight in the field.

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