



Attention Deficit Hyperactivity Disorder Among Adults with Severe and Profound Mental Retardation

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The present study investigated the incidence of attention deficit hyperactivity disorder in a sample of 86 adults with severe to profound mental retardation. Participants were evaluated by supervisory staff using the diagnostic criteria from the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1994) and Conners' (1990) Hyperactivity Index. Using the most conservative measure, 15% of the sample met the diagnostic criteria. This measure was not influenced by the subjects' chronological age, adaptive age, IQ, or gender. Implications of this finding for continued research and practice were discussed.

The prevalence of attention deficit hyperactivity disorder (ADHD) in school-aged children with average intelligence is estimated at 3 to 5%, with a 4:1 male-to-female ratio (American Psychiatric Association, 1994). Using a sample ($N = 245$) of 6- to 18-year-old children with mental retardation, Epstein, Cullinan, and Gadow (1986) reported 19.7% of the boys and 15.7% of the girls were hyperactive, based on a cutoff score of 15 on the abbreviated version of the Conners Rating Scale (Conners, 1973).

Historically, ADHD was considered a problem of childhood and presumed to dissipate during adolescence. However, more recent evidence indicates that this disorder persists into adolescence and adult life (Wender, 1987). The prevalence of ADHD in adults is not known (Shaffer, 1994), but is considered to affect up

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to 3% of the adult population (Feifel, 1996). The prevalence of ADHD in adults with mental retardation has been only indirectly studied. In a recent study by Cherry, Matson, and Paclawskyj (1997), 52.4% of younger adults and 60.7% of older adults with severe and profound mental retardation met the diagnostic criterion for Impulse Control and Miscellaneous Problems. Impulsivity is considered one of the hallmark characteristics of ADHD (Barkley, 1990).

Given that the prevalence of ADHD is considered higher in children with mental retardation than children with normal intelligence (Handen, McAuliffe, Janosky, Feldman, & Breaux, 1994; Pearson, Yaffee, Loveland, & Lewis, 1996), coupled with a growing consensus that ADHD continues into adulthood (Barkley, 1990), it seems logical that this disorder would be present in adults with mental retardation, possibly to a greater extent than adults with normal intelligence. The purpose of the present study was to investigate the incidence of ADHD in a sample of adults with mental retardation.

SUBJECTS AND PROCEDURES

The subjects were selected from a Midwestern residential facility serving 182 adults with mental retardation. The subject selection criteria for this study included being ambulatory, a diagnosis of severe to profound mental retardation, and the absence of psychotropic medications. Eighty-six subjects (61 males, 25 females) met these criteria with an average age of 41.4 years ($SD = 12.4$; range = 21 to 72), an average IQ of 22.2 ($SD = 12.89$; range = 12 to 49), and an average adaptive age of 3.3 years ($SD = 1.91$; range = 0.5 to 8.2).

Two instruments were used. The first instrument included the diagnostic criteria for ADHD from the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* (American Psychiatric Association, 1994) and were represented by two subscales. Included were nine items representing an Inattention Scale and nine additional items representing a Hyperactivity and Impulsivity Scale. Each item is rated for the presence (scored 1) or absence (scored 0) of each criterion, resulting in scale scores ranging from 0 to 9 for inattention and ranging from 0 to 9 for hyperactivity and impulsivity, respectively. The second instrument was the Hyperactivity Index from the *Conners' Rating Scales* (Conners, 1990), which includes 10 items that are rated on a four point scale (0 = not at all, 1 = just a little, 2 = pretty much, and 3 = very much). Hyperactivity Index scores could range from 0 to 30.

Ten supervisory staff members, responsible for ensuring the quality of the subjects' daily programs and monitoring their effectiveness, were selected to rate subjects using the two instruments. All staff had a minimum of a bachelor's degree, at least 1 year of experience working with individuals with mental retardation, and at least 6 months of experience working with the subjects they were assigned to rate. Staff were given instructions regarding administration of the study's measures. Each rater was given a list of subjects who they were familiar with and instructed to rate the subjects relative to other adults with

TABLE 1
Adjusted Mean Inattention, Hyperactivity/Impulsivity, and Hyperactivity Index Scores
from Multiple Analyses of Variance by Subject Age, Gender, IQ, and Adaptive Age

Subject Variables	<i>n</i>	Dependent Measures		
		Inattention	Hyperactivity/ Impulsivity	Hyperactivity Index
Age				
38 years or less	42	-5.20	2.92	9.99
39 years or older	44	4.86	1.68	7.53
Gender				
Male	61	5.80	2.75	9.98
Female	25	4.27	1.85	7.54
IQ				
20 or less	52	5.93	2.69	9.62
21 or more	34	3.80	1.87	7.65
Adaptive age				
2.75 years or less	43	5.36	2.37	10.11
2.80 years or more	43	4.36	2.18	7.16

mental retardation at similar developmental levels. Raters completed the scales while in the presence of the subject being rated.

RESULTS

Coefficient alpha was computed for each study instrument as a measure of internal reliability: *DSM-IV's* Inattention Scale = .87, *DSM-IV's* Hyperactivity and Impulsivity Scale = .85, and Conner's Hyperactivity Index = .92. For purposes of data analyses, subject variables were categorized to produce cell sizes with sufficient subject numbers for data analyses. Subject categories included: age, younger = 38 years or less, older = 39 years or more; IQ, lower = 20 or less, higher = 21 or more; adaptive age, lower = 2.75 years or less, higher = 2.80 years or more; and gender, males, females.

A multiple analysis of variance (MANOVA) was computed with age and gender of the subjects as the independent variables and total scores on the Inattention Scale, Hyperactivity and Impulsivity Scale, and Hyperactivity Index as the dependent measures. Adjusted mean scores for the dependent measures by the independent variables are shown in Table 1. No significant age, gender, or interaction effects were found. A second MANOVA was computed with adaptive age and IQ of the subjects as the independent variables and total scores on the Inattention Scale, Hyperactivity and Impulsivity Scale, and Hyperactivity Index as the dependent measures. Adjusted mean scores for the dependent measures by the independent variables are shown in Table 1. A significant effect was found for IQ [$F(3, 80) = 2.90, p = .04$]. Univariate *F*-tests indicated that subjects with lower IQS had significantly higher scores on the Inattention Scale ($M = 5.93$) than subjects with higher IQS ($M = 3.80$) [$F(1, 82) = 7.39, p = 0.008$]. There were no significant adaptive age or interaction effects.

TABLE 2
Percentage of Subjects in the Sample ($N = 86$) by Gender, Age, IQ, and Adaptive Age, Who Met Diagnostic Cutoff Criteria for ADHD-Inattentive Type on the *DSM-IV*'s Inattention Scale, for ADHD-Hyperactive/Impulsive Type on the *DSM-IV*'s Hyperactivity and Impulsivity Scale, and for Hyperactivity Based on Conner's Hyperactivity Index

Subject Variables	Diagnostic Criteria						
	<i>DSM-IV</i> 's ADHD Inattentive Type			<i>DSM-IV</i> 's ADHD Hyperactive/Impulsive Type		Conner's Hyperactivity	
	<i>N</i>	Met	Not Met	Met	Not Met	Met	Not Met
Gender							
Males	61	62	38	16	84	31	69
Females	25	36	64	12	88	12	88
Age							
38 or less	42	62	38	19	81	33	67
39 or more	44	48	52	11	89	18	82
IQ							
20 or less	52	69	31	19	81	35	65
21 or more	34	32	68	9	91	12	88
Adaptive age							
2.75 or less	43	70	30	16	84	39	61
2.8 or more	43	39	61	14	86	12	88
All subjects	86	55	45	15	85	20	80

Note. ADHD = attention deficit hyperactivity disorder; *DSM-IV* = *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*.

The following recommended cutoff scores were used to establish two *DSM-IV* diagnostic categories: (1) ADHD, inattentive type—six or more Inattention Scale items endorsed; and (2) ADHD, hyperactive-impulsive type—six or more Hyperactivity and Impulsivity Scale items endorsed. Conners (1990) recommended a cutoff score of 15 on the hyperactivity index for identifying hyperactivity. This same cutoff score also has been used in other ADHD research with subjects with mental retardation (Epstein et al., 1986; Pearson et al., 1996). The percentage of subjects in the present sample who met these diagnostic criteria by gender, age, IQ, and adaptive age are shown in Table 2.

Chi-square analyses were used to determine significant relationships ($p < .05$) between the dichotomized subject variables and whether or not the diagnostic cutoff criteria were met based on the three measures. For the *DSM-IV*'s Inattention Scale, significant relationships were found for gender, IQ, and adaptive age. Subjects who were male, had lower IQs, or lower adaptive ages were more likely to meet the inattentive criteria than subjects who were female, had higher IQs, or higher adaptive ages. For the *DSM-IV*'s Hyperactivity and Impulsivity Scale, no significant relationships were found for any of the subject variables. For Conner's Hyperactivity Index, significant relationships were found for gender, IQ, and adaptive age. Subjects who were male, had lower IQs,

or lower adaptive ages were more likely to meet the cutoff score of 15 on the Hyperactivity Index than subjects who were female, had higher IQs, or higher adaptive ages. Overall, as shown in Table 2, 55% of the sample met the criterion for ADHD, inattentive type, 15% met the criterion for ADHD, hyperactive and impulsive type, and 20% met the criteria for hyperactivity based on Conner's Hyperactivity Index.

DISCUSSION

Scores on the Inattentive Scale of the *DSM-IV* were significantly influenced by subjects' IQs. This scale also produced the highest incidence rate for meeting the diagnostic criterion for the ADHD, inattentive type (55%). This relatively high rate is consistent with the rates reported by Cherry and colleagues (1997) for impulse control. However, given that the *DSM-IV*'s Inattentive Scale is significantly influenced by IQ, coupled with the finding that its cutoff score is significantly related to a subject's gender, IQ, and adaptive age, it may not be the most appropriate measure for diagnostic use with this sample. Raw scores on the Conner's Hyperactivity Index did not differ between subjects based on IQ, age, gender, or adaptive age. However, cutoff scores based on this instrument were significantly related to the subject's gender, IQ, and adaptive age. The overall incidence rate of 20% found for the Conner's is significantly lower than the rate found for the *DSM-IV*'s inattentive scale, yet it remains susceptible to important subject characteristics. In contrast, raw scores on the *DSM-IV*'s Hyperactive/impulsive scale did not differ between subjects varying in age, IQ, gender, or adaptive age, nor were its diagnostic cutoff scores influenced by any of these subject characteristics. This measure also yielded the most conservative estimate of the incidence of ADHD in the sample (15%). As such, this measure may have the most promise of the three used for initial screening of ADHD in adults with mental retardation.

Based on the hyperactive/impulsive measure, 16% of the males and 12% of the females met the diagnostic criteria for ADHD. ADHD appears to be a potential comorbid disorder with mental retardation in adults. However, these incidence rates should be considered preliminary. The sample was a convenience sample, the subjects were limited to those with IQs in the lower ranges, and the staff members who completed the surveys were not trained diagnosticians. However, these individuals are responsible for initially identifying potential behavioral and mental disorders, including ADHD, in this population and making referrals for further evaluation and treatment. In addition, the qualifications and experience level of these staff members are typical for this field. Future studies investigating ADHD in adults with mental retardation should include interrater and test-retest reliability data for rating scales as well as direct observational measures of subject behavior and performance. Similar studies for children with mental retardation are available (Handen et al., 1994; Melnyk & Das, 1992).

Based on these incidence data from this preliminary study, ADHD appears to represent a more prevalent disorder in adults with mental retardation than adults

with normal intelligence, which is consistent with available findings for school-aged children. In addition to meeting the *DSM-IV* criteria, an accurate diagnosis of ADHD in adults with mental retardation requires an accurate history to substantiate the onset of symptoms before 7 years of age, direct measures of client behavior in comparison to similar measures with adults at the same developmental level, and ruling out other comorbid disorders, such as pervasive developmental disorder. A differential diagnosis of ADHD in an adult with mental retardation may lead to improved treatment outcomes. Treatment success, including pharmacotherapy, has already been demonstrated in ADHD children with mental retardation (Handen, McAuliffe, Janosky, & Feldman, 1995; Johnson, Handen, Lubetsky, & Sacco, 1994) and ADHD adults with normal intelligence (Wender, Reimherr, Wood, & Ward, 1985).

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