

Intelligence among Attention Deficit Hyperactivity Disordered (ADHD) Children (Aged 5-9)

Naheed Vaida¹, Nadhia Hussain Mattoo² and A. G. Madhosh³

*Institute of Home Science, University of Kashmir, Hazratbal 190 006,
Jammu and Kashmir, India*

¹Mobile: 9419007735; ¹E-mail: vaidanaheed@gmail.com

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ABSTRACT This research study aimed to identify the intelligence among Attention Deficit Hyperactive Disordered (ADHD) children. The study was conducted on a sample of 50 children selected randomly from different government and private schools of Srinagar city in Jammu and Kashmir State. Their age ranged between 5 and 9 years. Such children were identified using self designed ADHD diagnostic scale which consisted of 83 statements related to different areas of Inattention, hyperactivity, oppositional defiant disorder and conduct disorder. For intelligence of ADHD children, Colored form of Raven's Progressive Matrices was administered individually. On analysis, a significant relation was found between inattention- a subtype of ADHD and intelligence. Oppositional defiant disorder / conduct disorder was prevalent among hyperactive respondents and those diagnosed as having combined type of ADHD, whereas, children who were found to be inattentive were either depressed or anxious. Gender was found to have significant relation with hyperactivity and intelligence.

INTRODUCTION

ADHD is one of the most frequently diagnosed child psychiatric disorder which manifests itself in early childhood. It is characterized by developmentally inappropriate level of inattention, hyperactive/impulsive-motor activity that appears at least in two contexts that is, home and school and has been present for at least six months before the age of 7 years. In order to meet the criteria of ADHD it is important that the symptoms must be more frequent and severe than those of children of comparable developmental level and must cause significant impairment (American Psychiatric Association 1994).

There is no single, primary cause which is associated with ADHD in all children. Indeed the disorder is heterogeneous both in its etiology and symptomatology. ADHD is the result of complex interplay of biological and psychosocial factors. Biological risk factors that have been extensively investigated include inherited/congenital predisposition and neurotransmission dysregulation. Family genetic factors have also been studied and there is some evidence to indicate that ADHD in related conditions runs in families. Research into the cause of ADHD has continued to indicate some substantial genetic contributions. There may be some familial transmission involved in the cause of ADHD. Heritability estimates range from 60 per cent to 80 per cent. Molecular genetic studies into the cause

of ADHD have identified a number of individual genes as potential candidate genes in ADHD. Some of the research has focused on the dopamine (DA) neurotransmitters including the DA D2, DA D4 and DA D5 receptor genes and the DA transporter gene. However, the strongest evidence into the cause of ADHD links ADHD with the 7-repeat allele of DRD4, which mediates an intracellular response to DA and the 10-repeat allele of DAT1, which is linked with an elevated dopamine reuptake back into the neuron. Also, preliminary data have also linked the 10-repeat allele of DAT1 with poor response to methylphenidate (Ritalin), which acts primarily by inhibiting the dopamine transporter in the striatum (Paul 2007).

The best research into the case of ADHD comes from twin studies which have implicated environmental factors into the development of ADHD. Some of the studies have found that a moderate to significant proportion of susceptibility to ADHD may be accounted for by factors that are not shared by both twins. The non-shared factors have been found to have the greatest effect on children with conduct disorder and are believed to be somewhat less important contributors to the cause of ADHD. Examples of non-shared factors may include poor school performance, difficult temperament-inflated self-esteem, impulsivity, low verbal intelligence and biological events such as perinatal insult and head trauma. While shared family, peer and neighborhood risk factors may play a signifi-

cant role in the development of oppositional defiant disorder and conduct disorder, they may play a lesser role in the cause of ADHD. The adverse factors may include large amounts of siblings within the family, families that have experienced separation, single-parent households, child neglect, parental conflict and frequently poverty. Parental child-rearing practices, such as harsh physical discipline and poor supervision have also been implicated in oppositional defiant disorder and conduct disorder but are not believed to be strongly related to the cause of ADHD. Studies of environmental adversity have implicated pregnancy and delivery complications, marital distress, family dysfunction and low social class. The family unit is considered as one of the important social factors for causing ADHD disorder (Karahmadi 2006) and child rearing and socialization practice have also been implicated the causes of ADHD (Whalen 2002). Family acts as centre of love and affection, education and emotions. The family completes the personality and psychosocial balance. Self-esteem and self respect are lowered in these children due to frequent failure, physical abuse, parental blame and contempt. The parental behaviour like alcohol consumption, parental chronic anxiety and mothers' depression or being due to inappropriate environmental stimulators such as high number of family members/lack of comfort are also cause ADHD disorder.

ADHD is a disorder with symptoms of inattention or hyperactivity and impulsivity that can affect both daily life and school performance in school aged children. It is likely that ADHD has a uni-directional effect on intelligence in a number of ways. The impact of limited self-control and impaired sustained attention may well, diminish the acquisition of intellectual skills. However, to a large degree ADHD is likely to interfere with the application of skills and the efficient test taking strategies necessary to perform well on intelligence tests. Kalpan et al. (2000) found that distribution of estimated IQ for ADHD and normal groups of children did not differ significantly from a normal distribution. It was concluded that children with ADHD have an average IQ than normal children.

Objectives

- To know about the IQ of ADHD children.
- To study the differences in IQ among children of both the gender.

MATERIAL AND METHODS

Attention deficit hyperactivity disorder (ADHD) typically presents itself during childhood and is characterized by persistent pattern of inattention and hyperactivity/impulsivity. The present study was conducted on a sample of 50 children (aged 5 to 9 years) selected from different government and private schools of Srinagar city in Jammu and Kashmir. To identify such children, self- designed ADHD diagnostic scale was used which consisted of 83 statements related to inattention, hyperactivity, oppositional defiant disorder/conduct disorder, depression/ anxiety. All the statements were followed by 5 options, that is, very frequently, frequently, occasionally, rarely and very rarely. After children were identified as having ADHD, Raven's Colored Progressive Matrices was administered on them to know about their IQ. The data was tabulated and analysed using SPSS.

RESULTS AND DISCUSSION

Table 1 describes the respondents on various variables on median and standard deviation. Most of the respondents in the sample were of 7 years of age (st. dev 1.36), the age when most of the symptoms of ADHD are noticed by teachers and parents though they are present before also. As far as gender was concerned, most of the respondents were boys and ADHD was also found to be prevalent among the second borns (standard deviation 1.24). As far as inattention was concerned, 17 symptoms were checked and the respondents had a minimum of 13 symptoms present with the standard deviation of 3.79. Similarly, most of the respondents had 18 symptoms of hyperactivity present out of 26 checked. These symptoms pertain to various home, school and play situations. Standard deviation calculated was 5.18. Some of the respondents were also found to have combined form of ADHD, where symptoms of both inattention and hyperactivity are present.

Various co-morbid disorders have been associated with ADHD. Among them oppositional defiant disorder (ODD) and conduct disorder was found to be prevalent among the ones diagnosed as having ADHD. When IQ of such respondents was checked, most of them were able to answer 13 questions correctly out of 36 asked. Standard deviation found was 5.49. Among the

Table 1: Descriptive statistics

Variable	N	Mean	Median	St. dev
Age	50	7.16	7.00	1.36
Gender	50	1.32	1.00	0.47
Birth order	50	2.38	2.00	1.24
Inattention	50	12.08	13.00	3.79
Hyperactivity	50	16.98	18.00	5.18
Combined	50	29.12	29.00	6.30
ODD/CD	50	10.98	9.50	6.79
Dep/Anx	50	4.52	4.00	3.27
IQ	50	15.10	13.00	5.49

ODD/CD: Oppositional Defiant Disorder/ Conduct Disorder
Dep. Anx.: Depression/ Anxiety.

subtypes studied, significant relation was found to be between inattention and IQ (p value 0.02) whereas, in case of hyperactivity and combined type, no significant relation was found with IQ (Table 2). Benjasuwantep et al. (2004) assessed total sample 353 children from 1st – 5 grade. Raven's progressive test was used to test intellectual functioning. They found that ADHD students had lower score on intellectual than the group without ADHD and also children with ADHD are at risk for academic and behaviour problems. Biederman et al. (2005) utilized semi-structured interviews and found that male and female ADHD subjects reported similar impairments in emotional, school, family, and interpersonal functioning. It was also found that ADHD in both genders was associated with high levels of psycho-educational impairments (Biederman et al. 2005).

Table 2: Subtypes of ADHD and intelligence

Variable	Inattention	Hyperactivity	Combined
IQ	-0.31 ^S	0.14 ^{NS}	-0.05 ^{NS}

n-50, S-Significant, NS-Non Significant

Table 3 describes the relation between the subtypes of ADHD and various co-morbid disorders usually associated with it. As far as oppositional defiant disorder (ODD) and conduct disorder (CD) was concerned it was found to have no significant relation with inattention. Whereas, those respondents who were diagnosed as having hyperactivity, ODD/CD was also present (p value 0.00). Highly significant relation was also found between the combined subtype of ADHD and ODD/CD (p value 0.00). It has generally been found that individuals with ADHD, regardless of gender, have great difficulties in the area of social and emotional func-

tioning. Among the respondents studied no such relation was found between ODD/CD and IQ and between DEP/ANX and IQ (Table 4). Also significant relation was found between gender and hyperactivity and between IQ and gender whereas, no significant effect of gender was found on inattention, ODD/CD and depression (Table 5). In community samples, boys are 3 times more likely to be diagnosed as having ADHD than are girls. This discrepancy is even greater in clinic populations, where boys outnumber girls by a ratio of 6:1 or higher. Boys with ADHD are probably referred to clinics most frequently than girls. In fact one study found that once the antisocial symptoms are controlled for statistically, the frequency of ADHD in boys and girls is about the same (Szatmari 1992). It has generally been found that males are more likely to have Attention Deficit Hyperactivity Disorder, Oppositional Defiant Disorder, Conduct Disorder, Mental Retardation, learning disabilities, language disorders, Autism, and Aspergers Disorder (Hartung and Widiger 1998). The regression equation was: $IQ = 22.0 + 0.666 \text{ Age} - 3.52 \text{ Gender} - 0.057 \text{ Birth order} - 2.69 \text{ Inattention} - 2.57 \text{ Hyperactivity} + 2.30 \text{ COM} + 0.243 \text{ Oppositional Defiant Disorder/Conduct Disorder} - 0.121 \text{ Depression/Anxiety}$.

Table 3: Relation of sub-types of AHD with various co-morbid factors

Variables	Inattention	Hyperactivity	Combined
ODD/CD	0.06 ^{NS}	0.70 ^{HS}	0.64 ^{HS}
Dep/Anx	0.28 ^S	0.04 ^{NS}	0.16 ^{NS}

ODD/CD: Oppositional Defiant Disorder/ Conduct Disorder.
Dep/Anx: Depression/ Anxiety
n-50, S-Significant, NS-Non Significant, HS-Highly Significant

Table 4: Intelligence and co-morbid disorders

Variable	ODD/CD	Dep/Anx
IQ	0.14 ^{NS}	-0.19 ^{NS}

n-50, NS-Non Significant

CONCLUSION

From the study it is concluded that there exists a significant relation between inattention-a subtype of ADHD and intelligence. Oppositional defiant disorder / conduct disorder is prevalent among hyperactive respondents and those diagnosed as having the combined type of

Table 5: Relation of gender with ADHD, co-morbid disorders and intelligence

Variable	Birth order	Inattention	Hyperactivity	Combined	ODD/CD	Dep/Anx	IQ
Gender	0.27 ^{NS}	0.10 ^{NS}	-0.34 ^S	-0.22 ^{NS}	-0.15 ^{NS}	0.18 ^{NS}	-0.33 ^S

ODD/CD: Oppositional Defiant Disorder/ Conduct Disorder.

Dep/Anx: Depression/ Anxiety

n-50, S-Significant, NS-Non Significant

ADHD whereas, children who are inattentive are either depressed or anxious. Gender is also found to have significant relation with hyperactivity and intelligence.

RECOMMENDATIONS

- Children should be provided guidance and counseling as soon as they are identified as having ADHD.
- Parents and teachers should help such children in adjusting to daily routines.
- Parents and teachers should work together for the betterment of such children.

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