



A STUDY TO DETERMINE PSYCHIATRIC COMORBIDITIES IN CHILDREN WITH ATTENTION DEFICIT HYPERACTIVE DISORDER (ADHD)

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ABSTRACT **Introduction:** Attention deficit hyperactivity disorder (ADHD) is a common neurodevelopmental disorder which has onset in early childhood. ADHD is a clinically heterogeneous condition with multiple comorbidities challenging diagnosis and management. This study aims at finding existing comorbidities in young children having ADHD.

Materials & Methods: It was a cross sectional study carried out in tertiary care centre. 46 children were included in the study. DSM-IV TR was used to diagnose ADHD & Learning disorders. K-SADS-PL was used for diagnosing psychiatric co-morbidities. NISLD was used for conforming learning disorders.

Results: 35 (76.09%) had atleast one psychiatric comorbidity present. Amongst the children who had comorbidities, 18(39.13%) had one comorbidity, 12 (26.09%) had two comorbidities, 4 (8.69%) had three comorbidities and one child (2.17%) had four comorbidities. Most common comorbidities were Oppositional Defiant Disorder (ODD) and Learning Disorder (LD) with each being present in 18 children (39.13%). As a group Disruptive Behavior Disorders were present in 26 children (56.52%). Anxiety Disorders formed the second most common group with comorbidity in 9 children (19.57%). 3 (6.52%) had depressive disorder & 2 children had enuresis(4.35%).

Conclusion: ADHD in young children presents with many co-morbidities. These need to be identified for adequate and appropriate management of children having ADHD.

KEYWORDS : obsessive compulsive disorder, caregiver, burden of care

INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterized by persistent and impairing symptoms of inattention, hyperactivity, and impulsivity (1). It has a reported prevalence rates of 5%-8% in school age children. It is more common in boys than girls with a male to female ratio ranging from 3:1 to 10:1 (2). It negatively affects children's normal development and academic and social functioning (3). Current estimates show that 60% of children with ADHD continue to have symptoms of ADHD in adolescence and adulthood (4).

ADHD, is most commonly comorbid with other psychiatric and neurodevelopmental conditions. Presence of comorbidity can affect symptom presentation, increase symptom severity, and lead to greater impairment in day to day function (5). Children with ADHD are at increasing risk of developing complications or comorbidities throughout the course of their disorder when compared with the children without ADHD. Existence of comorbidity is correlated with persistence of ADHD symptoms in adulthood (4). Clinicians must be aware of common comorbidities associated with ADHD so that they can develop an effective, multidimensional treatment approach, addressing the condition that is causing the greatest impairment first, whether it be the ADHD or a comorbid disorder (6).

The overall prevalence of psychiatric disorders in children and with ADHD ranges from about 40 to 80% (7). Thus, in addition to an ADHD diagnosis, a clinician should look for a whole range of possible psychiatric conditions. As per existing literature, many disorders co-occur with ADHD in children like: oppositional defiant disorder (ODD) (50–60%), conduct disorder (CD) (20–50%), depression (16–26%) and anxiety (10–40%) disorders, bipolar disorders (11–75%), tic disorders (20%), obsessive compulsive disorders (6–15%) (8,9). Other comorbidities have also been observed in children with ADHD. Studies have reported a wide variety of learning difficulties coexisting with ADHD, with over 45% having at least one or more significant impairments in reading, arithmetic or spelling (7,10).

OBJECTIVES

To study the psychiatric comorbidities in children with Attention Deficit Hyperactivity Disorder presenting in a tertiary care setting.

MATERIALS AND METHODS

It was a cross sectional study. 46 children belonging to age group of 6-

12 years diagnosed with Attention Deficit Hyperactivity Disorder attending the Child and Adolescent Psychiatry OPD of a tertiary care centre were included in study. Data was collected on period sampling for 9 months. Sample was collected as per fulfilment of inclusion & exclusion criteria.

Inclusion Criteria

- Attention Deficit Hyperactivity Disorder diagnosed as per DSM IV TR criteria.
- Children belonging to age group of 6-12 years.
- Children accompanied by at least one caregiver who has been living with them for a minimum period of two years.
- Caregiver willing to give consent for the study.

Exclusion Criteria

Children diagnosed with mental retardation, uncontrolled seizure disorder, post encephalitic sequelae or any other medical disorder that is likely to interfere with the assessment.

TOOLS FOR STUDY

1. **Semi-structured Proforma:** It was used for assessment of socio-demographic variables, history taking, general physical examination and mental status examination.
2. **Diagnostic and Statistical Manual of Mental Disorders 4th ed., text revision (DSM-IV TR):** DSM IV TR criteria were used for diagnosis of ADHD & LD (11).
3. **Kiddie Schedule for Affective Disorders and Schizophrenia-Present and Lifetime version (K-SADS-PL):** To assess current and past episodes of psychopathology in children and adolescents according to DSM-IV criteria (12,13).
4. **NIMHANS Index of Specific Learning Disabilities (NISLD):** NISLD was used to confirm the diagnosis of learning disorder, which was made using DSM-IV-TR (14).

METHODOLOGY

The children diagnosed with Attention Deficit Hyperactivity Disorder as per DSM IV-TR presenting to Child and Adolescent Psychiatry OPD of tertiary care centre were approached after the diagnosis of child was confirmed. After applying the inclusion and exclusion criteria and explaining the purpose of study, those whose caregivers gave consent were included. K-SADS-PL was used to diagnose comorbidity. NISLD was used to confirm diagnosis of learning disorder.

RESULTS

SAMPLE CHARACTERISTICS:

Table 1a: Socio-demographic profile of children with ADHD (N=46)

Age (in years)	N	Mean	S.D.
	46	8.73	2.16

Table 1b: Socio-demographic profile of children with ADHD (N=46)

Variable		No. of children (n)	Percentage (%)
Sex	Male	41	89.13
	Female	5	10.87
Education	Not formally educated	7	15.22
	Primary	32	69.56
	Middle	7	15.22
Religion	Hindu	35	76.09
	Muslim	9	19.56
	Sikh	2	4.35
Family Type	Nuclear	35	76.09
	Joint	11	23.91
Domicile	Urban	33	71.74
	Rural	13	28.26
Informant	Father	37	80.43
	Mother	9	19.57

SUBTYPES AND SEVERITY OF ADHD**Table 2: Frequency of subtypes in children with ADHD according to DSM-IV TR (N=46)**

		No. of children (n)	Percentage (%)
A D H D Subtypes	Combined	32	69.56
	Predominantly Inattentive	10	21.74
	Predominantly Hyperactive-Impulsive	4	8.70

PSYCHIATRIC COMORBIDITIES IN CHILDREN WITH ADHD**Table 3a: Psychiatric Comorbidities in children with ADHD (N=46)**

Comorbidities	No. of children (n)	Percentage (%)
Present (Atleast one)	35	76.09
Absent	11	23.91

* Diagnosed as per KSADS-PL & DSM IV TR & NISLD

Table 4b: Distribution of number of comorbidities in children with ADHD (N=46)

No. of comorbidities*	No. of children (n)	Percentage (%)
None	11	23.91
One	18	39.13
Two	12	26.09
Three	4	8.69
Four	1	2.17

* Diagnosed as per KSADS-PL & DSM IV TR & NISLD

Table 5: Psychiatric comorbidities in children with ADHD according to KSADS-PL* (N=46)

Comorbidity	Present n (%)	Absent n (%)
Oppositional Defiant Disorder (ODD)	18 (39.13)	28 (60.87)
Conduct Disorder (CD)	8 (17.39)	38 (82.61)
Social Phobia (SP)	4 (8.70)	42 (91.30)
Generalised Anxiety Disorder (GAD)	3 (6.52)	43 (93.48)
Separation Anxiety Disorder (SAD)	2 (4.35)	44 (95.65)
Depression	3 (6.52)	43 (93.48)
Enuresis	2 (4.35)	44 (95.65)

*KSADS- PL : Kiddie Schedule for affective disorders and schizophrenia

Table 6: Learning Disorder in children with ADHD diagnosed with DSM IV TR and confirmed with NISLD* (N=46)

Comorbidity	Present n (%)	Absent n (%)
Learning Disorder (LD)	18 (39.13)	28 (60.87)

*NISLD: NIMHANS Index of Specific Learning Disabilities

DISCUSSION OF RESULTS

In the study sample of 46 children, mean age of presentation was 8.73 years (SD = 2.16). The children in this study belonged to age group of 6-12 years hence the mean age was lesser in comparison to similar studies done previously. In a study that included subjects aged 6 - 18 years diagnosed with ADHD, the mean age was 10.82 ± 3.24 (15), while in another study that included subjects from 6-18 years, the mean age was 10.1 years (SD = 3.2 years) (16). In the current study, range of age was kept from 6 years to 12 years to ensure homogeneity of data.

Most of the children in the study were males, with male to female ratio of 8.2:1. Previous studies mention male to female ratio of 4:1 (15,17). The ratio could be high in current study due to small sample size. Current study did not attempt to look into association of academic performance with ADHD symptoms.

In the study, majority of children (69.56%) were diagnosed with ADHD Combined Type followed by Predominantly Inattentive Type (21.74%) and least number of children belonged to Predominantly Hyperactive-Impulsive Type (8.70%). These results are consistent with previous studies. In a previous study, 59.4% of children with ADHD were diagnosed with Combined type, 31% with Predominantly Inattentive Type and 9.1% with Predominantly Hyperactive-Impulsive Type (16). In other study done with sample size of 1919, 58% of subjects had ADHD of combined type, 33% of inattentive type, and 9% of hyperactive/impulsive type (18). In comparison, a study which took samples from community reported higher percentage of Predominantly Inattentive Type of ADHD in comparison to other two Types (19).

In the current study, more than 3/4th of children with ADHD (76.09%) had at least one psychiatric comorbidity and rests (23.91%) were pure ADHD. In one study 63.7% of children with ADHD belonging to age group 6-18 years were found to have at least one psychiatric comorbidity (16). As far as distribution of comorbidities is concerned, in our study 11 children (23.91%) were pure ADHD without any comorbidities, 18 children (39.13%) had one psychiatric comorbidity, 12 children (26.09%) had two psychiatric comorbidities, 4 children (8.69%) had three psychiatric comorbidities and one child (2.17%) had four psychiatric comorbidities. Similar results were obtained in study where 36.3% children had only ADHD, 33.3% had ADHD with one additional disorder, 18.7% had two disorders, 8.2% had three disorders, 2.9% had four disorders, and 0.6% had five additional disorders besides ADHD (16). Another study done found at least 1 comorbidity in 55% & 2 or more comorbidities in 24% of children with ADHD (20). This shows that significant number of children with ADHD have more than 1 comorbidity.

In the current study most common comorbidities observed were Oppositional Defiant Disorder (ODD) and Learning Disorder (LD). Both were present in 18 (39.13%) children each with ADHD. Conduct Disorder (CD) was present in 8 (17.39%) children. Hence, Disruptive Behavior Disorders (ODD+CD) were present in as many as 26 children (57.52%) with ADHD. Literature also mentions significantly high percentage of co-morbid conduct disorders in children with ADHD. Studies report the frequency of ODD/CD comorbidity with ADHD to be as high as 90% (6). Few studies have found that 30%-50% children with ADHD also fulfill criteria for CD or ODD. (1). The strikingly high rates of comorbidity could at least be partially attributed to shared genetic origin (21). Longitudinal studies suggest that the correlation between ADHD-like and externalizing traits increases across age (1). This study along with the existing literature supports the finding that ADHD in children is associated with high percentage of conduct disorder and oppositional defiant disorder. This highlights the significance of exploring symptoms of disruptive behavior disorders comorbid with ADHD.

In current study learning disorder (LD) was also observed as a significant co-morbidity (39.13%). Existing literature reports wide variation in reports of comorbidity between ADHD and learning disorders, ranging from 10%-92%. This is possibly due to differences in diagnosis and discriminating between both the conditions in individual studies (10,22). In an earlier study, LD was present in 1/3 of children with ADHD (6). Thus it is very important to look for LDs in ADHD, as academic difficulties might be considered as a presentation of inattention.

After Disruptive Behaviour Disorders and Learning Disorders, Anxiety Disorders were the third most common comorbidity found in

children with ADHD in current study, being seen in 9 children (19.57%). Amongst Anxiety Disorders, Social Phobia (SP) was present in 4 children (8.70%), Generalised Anxiety Disorder (GAD) was present in 3 children (6.52%) and Separation Anxiety Disorder (SAD) was present in 2 children (4.35%). Previous studies report higher prevalence of comorbid anxiety disorders in ADHD. Previous research found that anxiety disorders occur in approximately 30% of patients with ADHD (23). Other studies report prevalence of anxiety disorders in ADHD to be ranging from 15-35% (1). The lower number in this study could be because of small sample size & narrow age group (6-12 years). Past studies generally have taken wider age group sample (till 18 years of age).

Depression was comorbid in 3 children (6.52%) and Enuresis was present in 2 children (4.35%). Literature depicts rate of major depression in youth with ADHD ranging from 12% to 50% which is more than five times higher than in youth without ADHD. It is also shown that this comorbidity is higher in clinical sample than in the community sample (1). Less prevalence in our study could be due to the age group of sample, which was less than 12 years of age.

As the current study included children belonging to 6-12 years age group only, the comorbidities like Substance Use, bipolar disorders which develop usually in adolescence or adulthood were not found.

LIMITATIONS

It was a cross sectional study, carried out in a tertiary care institute (clinical setting), with a small sample size & without control group. Thus it is difficult to apply the findings to community. Also the age group was < 12 years. So disorders like substance use, bipolar disorders which appear in adolescence were not found in current study. The informants were not screened for any psychiatric disorder which could have coloured the information provided by them during the study.

CONCLUSIONS & IMPLICATIONS

ADHD is a common neurodevelopmental disorder in children. Comorbidity is more of a rule rather than exception in children having ADHD. Significant number of children with ADHD have 1 or more comorbidities. This could have significant impact on clinical presentation, severity of impairment, diagnosis & management. So clinicians who are primary contact of children having ADHD should be aware of co-existing psychiatric morbidities, and regularly screen for them. Future studies also need to share some light on shared genetic basis of ADHD & its psychiatric co-morbidities.

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