IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 20, Issue 4 Ser.15 (April. 2021), PP 33-39
www.iosrjournals.org

Assessment of Severity and Elicitation of Comorbidities In Attention-Deficit Hyperactivity Disorder

Debpradip Chakraverty[1],Ranjita Santra*, Sujit Sarkhel[3] , Pradeep Kumar Saha[4]
[1]*Specialist MO (Psychiatry), Deben Mahata Government Medical College and Hospital, Purulia, West Bengal;*
[2] *Associate Professor and HOD, Department of Pharmacology, Deben Mahata Government Medical College and Hospital, Purulia, West Bengal;*
[*]*Associate Professor, Institute of Psychiatry, Institute of Postgraduate Medical Education and Research, Kolkata, West Bengal;*
[4] *Professor & Director, Institute of Psychiatry, Institute of Postgraduate Medical Education and Research, Kolkata, West Bengal;*
The work was carried out Institute of Psychiatry, Institute of Postgraduate Medical Education and Research, Kolkata.

Abstract
Background
Attention-deficit hyperactivity disorder (ADHD) is a common psychiatric problem in about 30 to 50% children who are referred to child psychiatric clinic. ADHD is by far common in males and Conduct Disorder is the most common comorbidity. Inattentive type of ADHD are most likely to have comorbidity.
Materials and Methods
1. Specially designed proforma for recording socio-demographic & clinical information.
2. Conners' Abbreviated Rating Scale (CARS)(Conners,1973) for assessing severity of ADHD.
3. Kiddie-SADS Present and Lifetime version(K-SADS-PL) scale for assessment of comorbid psychiatric conditions.
Results
First born children showed higher propensity to develop ADHD as well as comorbid disorders. Children with history of delayed cry showed higher propensity to develop comorbidities in ADHD. Our study has the distinction of being a first of its kind study evaluating the comorbidity of child and adolescent ADHD using the K-SADS-PL in eastern India and yielding DSM IV generated comorbidities. It also has the distinction of being one of the first to study the relationship between socio-demographic variables, severity and comorbidities in ADHD using a standardized tool.
Conclusion
Until more is known about actual attributes of family functioning in children with ADHD, it is not possible to specify type of interventions in decreasing symptoms. The health experiences from the perspective of the children living with ADHD will sensitize the community at large. Information is critical to understanding the magnitude of the disorder, the expression of ADHD in communities. Further research is needed to uncover the common courses of ADHD and how families manage the disorder.

Keywords: *ADHD, DSM-4, K-SADS-PL, IQ Score, Conners Abbreviated Rating Scale, co-morbidity*

Date of Submission: 29-04-2021 Date of Acceptance: 13-05-2021

Table1 showing sociodemographic characteristics

VARIABLE	MEAN±S.D/N(%)
AGE OF PRESENTATION OF ADHD	8.578±2.578
AGE OF ONSET OF ADHD	4. 223±0.974
SEX MALE	65(85.5)
FEMALE	11(14.5)
RELIGION HINDU	59(77.6)
MUSLIM	17(22.4)
CONSANGUINITY	11(14.5)
RESIDENCE RURAL	26(34.2)
URBAN	50(65.8)
FIRST BIRTH ORDER	38(50)
NUCLEAR FAMILY	60(78.9)
FAMILY H/O MENTAL ILLNESS	16(21)
PARENTAL ADHD	19(25)
SIBLING ADHD	10(13.2)

VARIABLE	ANY COMORBIDITY PRESENT	NO COMORBIDITY	χ^2	df	p
SEX MALE	35	30	0.266	1	0.606
FEMALE	05	06			
RESIDENCE RURAL	12	14	0.66	1	0.415
URBAN	28	22			
RELIGION HINDU	32	27	0.273	1	0.601
MUSLIM	08	09			
BIRTH WT LBW	10	05	1.477	1	0.224
NBW	30	31			
FIRST BIRTH ORDER	24	14	3.378	1	**0.06**
OTHER BIRTH ORDER	16	22			
PARENTAL ADHD	11	08	0.281	1	0.596
NO PARENTAL ADHD	29	28			
DELAYED BIRTH CRY	09	03	2.86	1	**0.09**
NO DELAYED CRY	31	33			

Table 2 showing comparison between sociodemographic and clinical variables in ADHD Subjects in terms of presence or absence of comorbidities

I. Background

Attention-deficit hyperactivity disorder (ADHD) is a common psychiatric problem in about 30 to 50% children who are referred to child psychiatric clinic. The prevalence of ADHD has been reported to be from 1.7 to 16 %. [1] Between 1957 and 1960, 31 articles were published on hyperactivity in children, whereas since 1996, there have been about 400 articles a year on ADHD. It is important to note that inattention, hyperactivity and impulsivity as isolated symptoms may be the final path for many problems related to conflicts with parents and/or colleagues and friends, inappropriate educational systems, or may even be associated with other disorders that are commonly observed in childhood and adolescence. Therefore, for the diagnosis of ADHD it is always necessary to contextualize the symptoms in the child's history. It is well known that more than 50% of patients with ADHD have co morbid psychiatric disorders such as conduct disorders, affective disorders and anxiety disorders. [2] Although the issue is still debated, the comorbid rate of bipolar disorders has been considered to be lower. [3] The clinical course and outcomes of ADHD are generally poorer in the presence of co morbid conditions than when there is no co morbidity, whether measured by parent-child interactions, poor school performance or risks for later substance abuse and antisocial personality disorder. The syndrome of ADHD is frequently associated with coexisting psychiatric disorders, and this comorbidity does not appear to represent an artifact of assessment. In the assessment as well as treatment process, it is important to diagnosis and treat all co morbidities in order to maximize treatment. This study was conducted to obtain socio demographic data in diagnosed ADHD cases, to assess the severity of illness in diagnosed cases of ADHD attending the Psychiatry out-door of a general hospital psychiatry unit, to elicit the comorbid conditions associated with ADHD, to evaluate the relation, if any, between severity of ADHD , comorbidities, and socio-demographic data of ADHD subjects.

PROCEDURE

The study was conducted in the Department of Psychiatry, IPGME&R, Kolkata for a period of one year. Study population was comprised of patients of ADHD who were recruited from Psychiatry outdoors. Consecutive sampling was done with cross-sectional assessment. Inclusion criteria were ADHD cases (newly diagnosed and drug naïve) diagnosed by two experienced psychiatrists, according to DSM-IV-TR criteria, age <18 years, informed consent was obtained, parent and their child who can communicate in English, Bengali or Hindi. Exclusion criteria were patients >18 years of age, parents unwilling to participate in the study, cases suffering from serious medical disorders, mental retardation cases, and those having pervasive developmental disorders. Study tools used were specially designed proforma for recording socio-demographic & clinical information, Conners' Abbreviated Rating Scale (CARS) for assessing severity of ADHD, and Kiddie-SADS Present and Lifetime version(K-SADS-PL) scale for assessment of comorbid psychiatric conditions. All the patients underwent thorough history, physical examination, mental examination, and recording of socio-demographic data.

Ethical clearance

The study protocol was submitted to and approved by the Ethics Committee of Institute of Postgraduate Medical Education & Research, Kolkata. Informed consent was taken from each patient and parents participating in the study. Each subject's name was replaced by an abbreviation in the study database to ensure confidentiality.

Statistical Analyses

The statistical analyses were done with the help of Statistical Package for Social Sciences(SPSS). Socio demographic variables (both continuous and discrete data) were summarized with the help of frequency, percentages and mean and standard deviation as applicable. Chi square and t-test for independent samples were employed wherever appropriate.

II. Results

About socio-demographic correlates

Out of 76 subjects diagnosed as ADHD after passing screening and supplemental assessment all were between the ages of 4 and 14 years (mean age of onset-4.2yrs, standard deviation 0.97). There were 39(51.3 %) elementary school students, and the majority (n = 65, 85.5 %) were male, 65.8% (n=50) were urbanites whereas most, i. e 54% (n=41) belonged to families with monthly income more than 15000. Most were moderate to severely impaired in functioning(C-GAS 41-60 in 80.2%, n=61) and 10.5 % (n=16) each had family history of depression and bipolar disorder in first generation family members. Half i.e 50% (n=38) were 1st born child and 78.9 %(n=60) belonged to nuclear family. Eight subjects belonged to age group 5 years;(10.5 %), 49 were in 6to 10 years group(64.47%) and 19 were aged more than 10years- (25%) . Age of onset in 90.8% (n=69) cases was 3-5yrs.Mean age of onset of ADHD was 4.22yrs with standard deviation of 0.974. All these have been

depicted in table 1. No significant variation in distribution of Conners score between clinical variables could be elicited.

Age of presentation

The mean age of diagnosis was 8.5 years with the majority seeking evaluation during school transition times during 2nd and 4th grade.

Gender

Male: Female ratio was almost 6:1 and inattentive type was more prevalent in girls (1.38:1).

Family Type

We found ADHD to be more common in children belonging to nuclear families.

Income

In our study more than 54% subjects hailed from families with monthly income more than 15000Rs.

First Birth Order

In our study, 24(60%) of participants who had any comorbidity were first born. Further analysis revealed a trend pattern (p= 0.06) which may achieve significance with a larger sample size.

History of delayed cry

In our study, nine out of twelve (75%) of those with delayed cry had at least one comorbidity. A chi-square analysis between delayed cry and presence of any comorbidity revealed trend pattern (p=0.09).This fact is in harmony with a study by Bhat et al(2005) where sixty-four children aged 6 to 12 years diagnosed with ADHD were assessed for a history of obstetrical complications using the Kinney medical and gynecological questionnaire. Learning ability was appraised using the Wide-Range Achievement Test (WRAT-R) for Anglophone students and the "Test de RendementFrançais" for francophone students. Results showed children with ADHD and a learning disability in mathematics had a higher rate of neonatal complications of great severity (p = 0.01) than children with ADHD and no disability in mathematics. Children with ADHD and a learning disability in reading also had a preponderance of neonatal complications of high severity (p compared to their peers with ADHD and no learning disability in reading.

Children with ADHD and comorbidities tend to have a significant history of neonatal complications, which validates the theory that complications in early life could adversely affect a child's academic ability later in life. Most were moderate to severely impaired in functioning(C-GAS 41-60 in 80.2%, n=61)

Low-birth weight and ADHD

We did not find increased incidence of ADHD in LBW children.

Family History of ADHD

Our study found exactly 25% of participants had 1st degree ADHD relatives. In our study, 10.5 % (n=08) each had family history of depression and bipolar disorder in 1st degree relatives. Around 90% had none of their 1st degree relatives suffering from mental illness, n=11(14.5%) were born of consanguineous marriage as shown in figure 1.

FAMILY HISTORY OF PSYCHIATRIC ILLNESS AND CONSANGUINITY

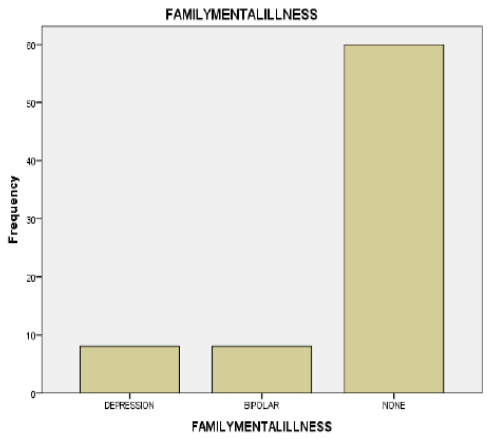

Figure 1

About Co-morbidity

According to the DSM-IV criteria, subtypes of ADHD classification, 41(53.9 %) subjects were diagnosed with combined-type ADHD, 21 (27.6 %) were the predominantly inattentive type, only 14 (18.4%) was determined to have the predominantly hyperactive-impulsive type of ADHD as shown in figure 2 and 3. Except for 36 (47.4 %) subjects who had no comorbid disorders, 40 (52.6 %) subjects had at least one comorbid disorder. Twenty four of them (40%) were first born. Fourteen of them (18.4%) had two comorbidities and 3 had three comorbidity (3.94%).The most common comorbid disorder was conduct disorder (n = 17, 22.36 %), while oppositional defiant disorder (n = 14, 18.4 %) was the second most common comorbid diagnosis. Anxiety disorders (n = 8, 10.52 %) were the third most common comorbid disorder i.e separation anxiety, n= 4, (5.3%)along with exactly same frequency of major depressive disorder, obsessive compulsive disorder and phobia, n=2 each,(2.6%)and the remaining disorders were identified as tic disorder n= 04,(5.3%),elimination disorders, n=3, (3.9%) and adjustment disorder with anxious mood, n=3 (3.9%). Mean conners rating was 20.99 with standard deviation of 2.999 as shown in figure 3. According to K-SADS PL, frequency of Psychiatric comorbid disorders was such that except for 36 (47.4 %) subjects who had no co morbid disorders, 40 (52.6 %) subjects had at least one co morbid disorder. Fourteen of them (18.4%) had two co morbidities and 3 had three comorbidity (3.94%). Among the ADHD subtypes, the combined type 53.66% (n=22) had atleast one comorbidity, 66.67% (n=14)of inattentive type had some comorbidity whereas only 28.57% (n=04)of hyperactive impulsive type had atleast one comorbidity as depicted in table 2.

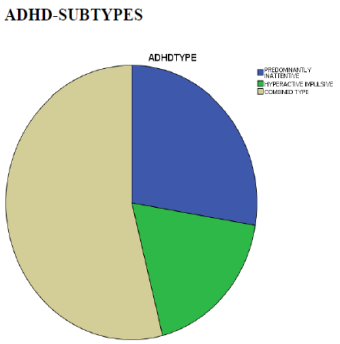

Figure 2

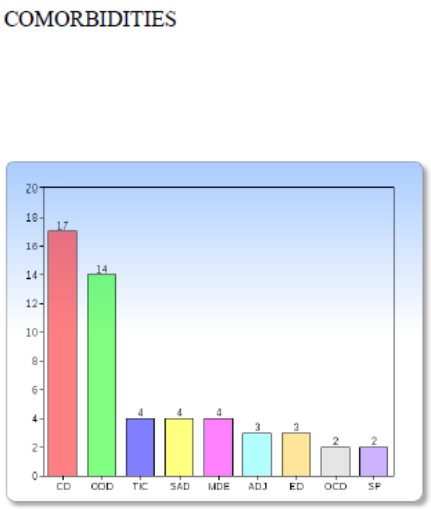

Figure 3

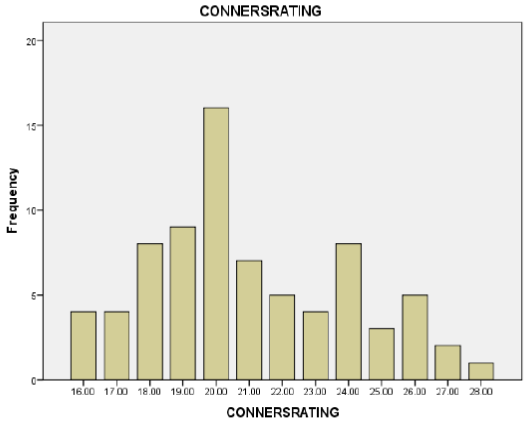

Figure 4

Twenty four (40%) of those with at least one comorbidity were first born. A chi-square test between 1st born and presence of any comorbidity revealed trend pattern (p=0.06). Nine of twelve (75%) of those with delayed cry had at least one comorbidity. Chi-square test between delayed cry and presence of any comorbidity revealed trend pattern(p=0.09).

III. Discussion

The relationship between ADHD and paediatric bipolar disorder remains controversial, and reaching any conclusion about this relationship is difficult because of the lack of internationally agreed diagnostic criteria for paediatric bipolar disorder. The mean age of diagnosis was 8.5 years with the majority seeking evaluation during school transition times during 2nd and 4th grade. It has been documented somewhat different findings with symptoms of ADHD apparent in most cases before the age of seven years. [4] This difference may be explained by the fact that awareness of psychiatric disorders is lesser in developing countries. Epidemiological studies have shown that ADHD is more prevalent in males than in females. Most studies in the past have relied on male subjects and identification of girls with ADHD has been hampered by parental and teacher bias, and confusion. Girls are more likely to be inattentive without being hyperactive or impulsive, compared to boys. [5] These findings are echoed in our study where male: female ratio was almost 6:1 and inattentive type was more prevalent in girls (1.38:1). Research provides evidence that in larger population samples, the male-to female ratio is 3: 1. [6] Findings in this sample are surprisingly similar, raising the concern that ADHD may also be under-diagnosed in girls in the community. Behavioral problems have been reported to be high in Indian children belonging to nuclear families. [7] Similarly, in our study too we found ADHD to be more common in children belonging to nuclear families. In a nuclear family, a child can be affected by anxiety and tension between parents which can result in increased behavioral problems in them. Living in poverty has been identified as an environmental risk factor associated with ADHD. [8] However in our study more than 54% subjects hailed from families with monthly income more than 15000Rs. This differs from Indian studies quoting ADHD more prevalent in low and middle income group. [9] In our study, 24(60%) of participants who had any comorbidity were first born. Some Indian studies have also found 24-54% of ADHD cases to be the eldest [10] but a twin study by could not find any relationship between birth order and hyperactivity. [11] In our study, nine out of twelve (75%) of those with delayed cry had at least one comorbidity. This is in harmony with a study where sixty-four children aged 6 to 12 years diagnosed with ADHD were assessed for a history of obstetrical complications using the Kinney medical and gynecological questionnaire.[12] Children with ADHD and comorbidities tend to have a significant history of neonatal complications, which validates the theory that complications in early life could adversely affect a child's academic ability later in life. Review of literature outlines factors of genetic risk. Statistically about 25% of children with ADHD have a first degree relative with ADHD. Our study found exactly 25% of participants had 1st degree ADHD relatives. All of the comorbid affective disorders were major depressive disorders and no patient was diagnosed with bipolar disorder. This finding is likely due to the popular observation that bipolar disorders are rarely diagnosed in school-age children. [13] All of the comorbid affective disorders were major depressive disorders and no patient was diagnosed with bipolar disorder. This finding is likely due to the popular observation that bipolar disorders are rarely diagnosed in school-age children. Interestingly contrary to other studies of the ADHD subtypes, the inattentive-type group had a higher ratio of comorbidity than hyperactive impulsive or combined type. This might be due to comprehensive detection tool employed by us,which apart from detecting disruptive disorders was equally equipped to detect disorders as depressive, anxiety, elimination. Study limitations are: 1. Inability to diagnose learning disorders because of the limited availability of instrument and these are important comorbid

disorders associated with ADHD; 2. Studies using outpatient-inpatient study methodologies may be subject to referral bias, which could have inflated the rates of comorbidity in the sample. Thus it is possible that the ADHD patient group that visited our hospital had a higher incidence of psychopathology than the ADHD group in the general population.

IV. Conclusion

ADHD is by far common in males and Conduct Disorder is the most common comorbidity.

Inattentive type of ADHD are most likely to have comorbidity. First born children showed higher propensity to develop ADHD as well as comorbid disorders. Children with history of delayed cry showed higher propensity to develop comorbidities in ADHD. Our study has the distinction of being a first of its kind study evaluating the comorbidity of child and adolescent ADHD using the K-SADS-PL in eastern India. Unlike previous studies which relied principally on behavioral features in ADHD children, our study has the distinction of yielding DSM IV generated comorbidities. It also has the distinction of being one of the first to study the relationship between socio-demographic variables, severity and comorbidities in ADHD using a standardized tool.

Future Directions

Until more is known about actual attributes and mechanisms of family functioning in children with ADHD, it is not possible to specify type of interventions that would be most effective in decreasing symptoms. Coming to understand the health experiences from the perspective of the children living with ADHD, will sensitize and informs the health community and community at large of what it like to live with ADHD. Further research is needed to uncover the common courses of ADHD; and how families manage the disorder. Further research is necessary to provide epidemiological data on ADHD. Information is critical to understanding the magnitude of the disorder, the expression of ADHD in communities, the receipt and quality of community care, and factors associated with differential outcomes in children with the disorder. The results may be used to further improve clinical management and research in patients with ADHD. Follow-up studies to evaluate the stability of the diagnoses, treatment responses, and studies comparing role of genetics and parenting inetiogenesis of ADHD may further enlighten us.

References

[1]. Goldman LS, Genel M, Bezman RJ, Slanetz PJ. Diagnosis and treatment of attention-deficit/hyperactivity disorder in children and adolescents. Council on Scientific Affairs, American Medical Association. JAMA. 1998;279:1100–1106
[2]. Biederman J, Faraone S, Mick E, Wozniak J, Chen L, Ouellette C, et al. Attention-deficit hyperactivity disorder and juvenile mania: an overlooked comorbidity? J Am Acad Child Adolesc Psychiatry. 1996;35:997–1008.
[3]. Hechtman L. ADHD and bipolar diorder. ADHD Report. 1999;7:1–4.
[4]. Applegate, B., Lahey, B. B., & Hart, E. L., et al. (1997). Validity of age-of-onset criterion for ADHD: A report from the DSM-IV field trials. Journal of American Academy of Child and Adolescent Psychiatry, 36, 1211-1221.
[5]. Staller, J. &Faraone, S.V. (2006). Attention-deficit hyperactivity disorder in girls:Epidemiology and management. CNS Drugs, 20, 107-123.
[6]. Gaub, M., & Carlson, C. L. (1997). Gender differences in ADHD: A meta-analysis and critical review. Journal of the American Academy of Child and Adolescent Psychiatry, 36, 1036-1045
[7]. Verghese A, Beig A, Senseman LA, Rao SS Sunder, Benjamin V. A social and Psychiatric study of a representative group of families in vellore town. Indian J Med Res. 1973;61:608–19.
[8]. Conners, C. K. (2003). Functional impairment in ADHD: The therapeutic target.Contemporary Pediatrics, Suppl, 1, 4-6.
[9]. MalhiP,SinghP,Spectrum of attention deficit hyperactivity disorders in children amongst referral to psychological services,Indian Pediatrics,2000,37, 1256-1260
[10]. Gada M. A study of prevalence and pattern of attention deficit disorder with hyperactivity in primary school children. Indian I Psychiatry 1987; 29: 113-118.
[11]. Godman R, Stevenson 1. A twin study of hyperactivity-II. The etiological role of genes, family relationships and perinatal adversity. I Child Psychol Psychiatry 1989; 30: 691-709.
[12]. Hunt, R. D., Paquin, A., & Payton, K. (2001). An update on assessment and treatment of complex attention-deficit hyperactivity disorder. Pediatric Annals, 30(3), 162-172.
[13]. McClellan J, Werry J. Practice parameters for the assessment and treatment of children and adolescents with bipolar disorder. J Am Acad Child Adolesc Psychiatry. 1997;36(10) Suppl:157S–176S.

Debpradip Chakraverty, et. al. "Assessment of Severity and Elicitation of Comorbidities In Attention-Deficit Hyperactivity Disorder."*IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(04), 2021, pp. 33-39.