

Comorbidity & socioeconomic status associated with attention deficit hyperactive disorder

Nazar FA¹, K. Suguna²

¹Dr. Feizal Abdul Nazar, Senior Resident, Department of Pediatrics, Kilpauk Medical College, Chennai, ²Dr.K.Suguna, Professor, Department of Pediatrics, Kilpauk Medical College, Chennai, Tamil Nadu, India.

Corresponding Author: Dr. K.Suguna, Professor, Department of Pediatrics, Kilpauk Medical College, Chennai, Tamil Nadu, India. Email: drsugunak@gmail.com

Abstract

Aims & Objectives: (1) To find out the prevalence of ADHD in urban primary school children (2) To find out the presence of any co-morbid disorders associated with ADHD. **Settings and design:** This is a cross sectional study of school children selected from 15 different Govt. Schools nearby Govt. Royapettah Hospital, attached to Govt. Kilpauk medical college, Chennai. **Material & Methods:** 1000 children aged between 5 and 11 years were randomly selected from 15 different schools in Chennai. The presence of ADHD was then assessed by using Vanderbilt assessment scale Teacher's version by their class teachers. Those children screened positive were verified and reassessed for the presence of any comorbid factors by using Child Behavioural Checklist (CBCL) scale. All children screened positive were subjected to psychiatrist evaluation. **Results:** The prevalence of ADHD among urban primary school children in Chennai, Tamilnadu was found to be 9.67%. Poor academic performance was the most common associated comorbid condition (18.75%), followed by poor social behaviour (17.7%). **Conclusion:** The present study shows Poor academic performance was the most common associated comorbid conditions, followed by poor social behaviour.

Key words: Attention Deficit Hyperactivity Disorder, Vanderbilt Assessment Scale-Teacher's Version, Comorbidity.

Introduction

ADHD is characterised by a pattern of diminished sustained attention, hyperactivity and higher level of impulsivity in a child or adolescent which are not appropriate for someone of that age and development. The abnormality of the symptoms must be statistically inappropriate for the child's age, developmental level and duration of the symptoms must be present for at least six months [1]. Though it is childhood disorder it may continue into adulthood [2].

Research in ADHD is in its nascent stage in India [3]. Venkata J A et al [1] in 2013 screened 770 primary school children aged 6 to 11 years at Coimbatore, prevalence of ADHD was found to be 11.32% with higher prevalence among males [66.7%] compared to females [33.3%]. The prevalence was found to be higher among lower socioeconomic status [16.33%] compared to middle socioeconomic group [6.84%] children. Compared with non-ADHD peers, ADHD affected persons are at greater risk for substance abuse

[4], antisocial behaviour, learning and reading disabilities [5], anxiety, mood disorders [6] extending into their adolescence and adulthood. In general, the high frequency of associated comorbid illness has been argued to reflect the heterogeneity of ADHD itself. Hence this disorder places substantial demand on mental health, educational, and judicial services.

Prabhjot Malhi et al [3] in 1999, have done a study on spectrum of ADHD among psychiatric outpatient referrals, they concluded that ADHD is one of the highly prevalent psychiatric disorder in childhood with significant functional impairment. Recognition of these associated comorbid conditions carries important implications for assessment, treatment approaches, and prognosis. Even though ADHD can be diagnosed in pre-schoolers, most of the cases are referred for assessment only after their behaviour create problems in school.

With this background we screened government school children for ADHD, to identify the comorbid conditions among the affected children. This might enable us to stress the importance of early screening of school

Manuscript received: 10th May 2018
Reviewed: 20th May 2018
Author Corrected: 27th May 2018
Accepted for Publication: 31st May 2018

Editorial

children for ADHD and its comorbidities for early comprehensive treatment of the children to have a normal functioning life.

Material and Methods

This study is a descriptive type of study done at Govt. Kilpauk Medical College and Govt. Royapettah Hospital, Department of Paediatrics. The study protocol was approved by Ethical Committee for research studies of Govt. Kilpauk Medical College and Hospital.

Study design: Cross sectional study

Study population: School children in the Government schools in and around Govt. Royapettah Hospital, Chennai were included in the study. These schools cater mainly to urban lower and middle socioeconomic group of children in Chennai.

Sample size: 1000 School going children aged between 5 and 11 were selected from 15 different schools in Chennai District.

Inclusion criteria: Children between the age group of 5 to 11 years.

Exclusion criteria

1. Children with history of seizures/developmental delay.
2. Children with history of neurologic illness/endocrine disorders.
3. Children with history of chronic illness/prolonged drug intake.

Tools used in the study

(1) Vanderbilt Assessment Scale- Teacher's version [7]: This is a rating scale based on DSM diagnostic criteria for ADHD. It consists of several behaviour parameters. This scale is rated by teachers. The scale has two components: symptom assessment and impairment in performance. The symptom assessment screens for symptoms that meet criteria for both inattentive (items 1-9) and hyperactive ADHD (items 10-18). To meet the criteria for the diagnosis, one must have at least 6 positive responses to either the inattentive 9 or hyperactive 9 core symptoms, or both. A positive response is a 2 or 3 (often or very often).

The second section of scale has a set of performance questions (36-43), scored 1-5, with 4 and 5 being somewhat of a problem/problematic. To meet the criteria for ADHD there must be at least one item of the

performance set in which the child scores a 4 or 5; that is there must be impairment, not just symptoms to meet diagnostic criteria. The initial scales also have symptom screens for 3 other comorbidities such as oppositional defiant, conduct, anxiety and depression. They must score a 2 or 3 out of 10 items on questions 19-28 and score 4 or 5 on any of the performance questions 36-43 to meet screen for oppositional-defiant/conduct disorder. For anxiety/depression screen, must score a 2 or 3 on 3 out of 7 items on questions 29-35 and score a 4 or 5 on any of the performance questions 36-43.

(2) Child Behaviour Check list (CBCL) Scale [8]:

This scale is used to assess the presence of co-morbid factors, social behaviour and academic performance of those children, who were identified having ADHD.

Methodology: After getting the approval from the institutional and Ethical Committee of Government Kilpauk Medical College and Hospital, Chennai the research was initiated. Prior permission was sought from the Educational Officer of Chennai Corporation for conducting the study at corporation schools.

Thousand children aged between 5 and 11 years were randomly selected from 15 different schools in Chennai after obtaining informed written consent from their parents. The school teachers were given awareness training regarding ADHD in two sessions. During the first session, the teachers were sensitized about ADHD with the help of audio-visual aid in Tamil and their academic & social implications were explained. During the second session the teachers were trained to fill the Vanderbilt assessment scale Teacher's version with the help of power point presentation. Following the awareness campaign the presence of ADHD was then assessed by using Vanderbilt assessment scale Teacher's version by their respective class teachers. Periodic school visits were undertaken during this period to clarify their doubts and help the class teachers in assessing the children and filling up the questionnaire.

The filled up questionnaire was then analysed and those children screened positive were instructed to attend the hospital with their parents. Children with impaired assessment were verified and reassessed for the presence of any comorbid factors by using Child Behavioural Checklist (CBCL) scale, the information for which was sought from their parents by means of a questionnaire in the outpatient department. All children screened positive were subjected to psychiatrist evaluation for a final confirmation of diagnosis and further management. Children diagnosed with ADHD were referred to child guidance clinic for followup.

Results

Among 1000 school children screened 120 children were positive; i.e [12%] of the screened. 96 of these positively screened children were confirmed by the psychiatrist to have ADHD (Table I). The prevalence of ADHD in this study was 9.67%. The most affected age group is between 10 - 11 years [21.4%] (Table II). The prevalence of ADHD is 2.7 times more common in males than females (Table III). In this study, the most common subtype was the combined subtype [45.83%] followed by attention deficit [36.46%] and hypertensive impulsive type [17.71%]. The prevalence of ADHD is more in children from lower socioeconomic group 11% compared to middle socioeconomic group (Table IV).

In the affected children comorbidities were present in 60.42% (Table V). Most of the children (77.59%) had only one associated comorbidity and 22.41% of them had two or more comorbid conditions (Table VI) Poor academic performance (18.75%) and poor social behaviour were the most frequently observed co morbidities (Table VII).

Table-I: ADHD diagnosed among suspected.

ADHD diagnosed among suspected	Number	Percentage [%]
ADHD positive	96	80%
ADHD positive [drop outs]	7	5.83%
ADHD negative	17	14.17%
Total	120	100%

Table-II: Age wise prevalence of ADHD.

Age in years	Total number of children with ADHD	Percentage [%]
5	3	9.37
6	12	9.23
7	17	9.60
8	12	8.21
9	15	8.82
10	18	10.71
11	19	10.73

Table-III: Gender Distribution of ADHD

Gender distribution	ADHD	%
Male	70	72.92
Female	26	27.08
Total	96	100
P value chi square test		0.0001

Table-IV: Socioeconomic Status of ADHD

Socioeconomic status	ADHD	Total	%
Upper	0	9	0
Upper middle	3	32	9.37
Lower middle	8	105	7.62
Upper lower	30	354	8.47
Lower	55	500	11
Total	96	1000	
P value chi squared test			0.0010

Table-V: Presence of comorbidities in ADHD.

Presence of Comorbidities in ADHD	Number	Percent (%)
Present	58	60.42
Absent	38	39.58
Total	96	100

Table-VI: Number of comorbidities in ADHD

Number of Comorbidities in ADHD	Number	Percent (%)
One	45	77.59
Two	12	20.69
Three	1	1.72
Total	58	100

Table-VII: Comorbid conditions in ADHD

Comorbid condition	No: of children	Prevalence (%)
Reading difficulty	13	13.5
Writing difficulty	10	10.4
Behavioural difficulty	11	11.45
Poor social behaviour	17	17.7
Poor academic performance	18	18.75
Conduct disorder	2	2.08

Discussion

ADHD is characterised by a pattern of diminished sustained attention, hyperactivity and higher level of impulsivity which are not appropriate for the age and development. The prevalence of ADHD in this study was 9.67%, consistent with that of several studies which showed a wide range of prevalence rates ranging from 2% to 17 % [3,9,10,11]. ADHD affects the interplay of biological, social and psychological factors. There is no definite etiology for ADHD. There are various studies suggesting different contributing factors for ADHD including perinatal mechanic insult to fetal nervous system, perinatal toxic exposure, prematurity, food additives, refined sugar, food allergens, family dysfunction [12,13].

Prevalence of ADHD was found to be highest among children in the age group of 10 - 11 years in our study which is validated by several studies showing that children with a mean age of 9 - 11 years were the most affected by ADHD [14,15,16,17]. ADHD is more prevalent among the male children compared to female [3,11,18], which is proven in our study as well. According to DSM V, there are 3 subtypes of ADHD: predominantly inattentive type, predominantly

hyperactive / impulsive type and combined type. In this study combined type is predominant (45-83%); consistent with previous study done by Pingali et al [18]. The prevalence among middle and lower socioeconomic status is more than upper class; this difference to be highly significant. Venkata JA et al [1] also reported higher prevalence among lower socioeconomic group. Palaniappan P et al [19] reported around 40-86.3% of ADHD presented with comorbidities, similar to our study (60.42%). The comorbidities associated were identified as reading difficulty (13.5%), writing difficulty (10.4%), behavioural difficulties (11.45%), poor social behaviour (17.7%), poor academic performance (18.75%) and conduct disorders (2.08%).

Recognition of these associated comorbid conditions carries important implications for assessment, treatment approaches and prognosis. Poor outcome is expected in a child with associated adverse psychosocial circumstances and comorbidities [20]. Pharmacological, behavioural and combined pharmacological and behavioural interventions are the best commonly prescribed treatments for ADHD.

Editorial

Limitations in the study

1. Children from Low socio economic status were predominantly studied.
2. Vanderbilt assessment scale Teacher's version was used for initial assessment.

Recommendations

It is a multidisciplinary approach which includes parents, teachers, paediatricians, ophthalmologist and psychologist.

- 1) School Health Services: Awareness program regarding ADHD to be included in the school health program for screening ADHD and also to sensitise the class teacher to identify children and refer to paediatrician for further evaluation, so to give guidance and counselling to parent and child.
- 2) To identify the comorbid conditions like reading difficulty, writing difficulty etc and give special education to these children at school & home. So that to improve the academic performance and decrease the incidence of school drop outs.

Conclusion

From the results of the present study it can be concluded that

1. The prevalence of ADHD among urban Government primary school children in Chennai, TAMILNADU is 9.67%
2. Children from lower socioeconomic status are more vulnerable for ADHD in our study but requires study among population representing all socioeconomic strata.
3. Poor academic performance was the most common associated comorbid condition, followed by poor social behaviour.

Acknowledgement: The authors thank the school teachers, parents and psychiatrist for their support, cooperation and technical assistance to carry out the study.

Declaration: Institutional ethical committee approval obtained.

Funding: Nil, **Conflict of interest:** None initiated, **Perission from IRB:** Yes

References

1. Venkata JA, Panicker AS. Prevalence of attention deficit hyperactivity disorder in primary schoolchildren. *Indian J Psychiatry* 2013;55:338-42.

2. Hallowell, E.M. and J.J. Ratey. *Driven to Distraction: Recognizing and Coping with Attention Deficit Disorder from Childhood through Adulthood*. New York: Simon and Schuster, 1994

3. Singhi P, Malhi P. Attention deficit hyper-activity disorder in school aged children: Approach and principles of management. *Indian Pediatr* 1998; 35: 989-999.

4. Levin FR, Kleber HD. Attention-deficit hyperactivity disorder and substance abuse: relationships and implications for treatment. *Harv Rev Psychiatry*. 1995 Jan-Feb; 2(5):246-58.

5. Tannock, R. and Schachar, R. (1996). Executive dysfunction as an underlying mechanism of behavior and language problems in attention deficit hyperactivity disorder. In *Language, learning, and behavior disorders: developmental, biological, and clinical perspectives* (ed. J.H. Beitchman, N. Cohen, M.M. Konstantareas, and R. Tannock), pp. 128– 55. Cambridge University Press, New York.

6. Szatmari P, Offord DR, Boyle MH. Ontario Child Health Study: Prevalence of attention deficit disorder with hyperactivity. *J Child Psychol Psychiatry* 1989;30: 219-30

7. Vanderbilt assessment scale–teacher's version :http://www.jeffersandmann.com/client_files/file/JMA_Vanderbilt-Teacher-Informant.pdf

8. Child Behaviour Checklist (CBCL) Scale: <http://www.aseba.org/forms/schoolagebcl.pdf>

9. Scahill L, Schwab-Stone M, Merikangas KR, Leckmaz JF, Zhang H, Kasl S. Psychosocial and clinical correlates of ADHD in a community sample of school-age children. *J Am Acad Child Adolesc Psychiatry* 1999;38:976-84.

10. Bhatia MS, Nigam VR, Bohra N et al. Attention deficit disorder with hyperactivity among paediatric outpatients. *J Child Psychol Psychiatry* 1991;32:297-306

11. Bhatia MS, Choudhary S, Sidana A. Attention deficit hyperactivity disorder among psychiatric outpatients. *Indian Pediatr* 1999; 36: 583-587.

12. Milberger, S., Biederman, J., Faraone, S.V., Chen, L., and Jones, J. (1996). Is maternal smoking during pregnancy a risk factor for attention deficit hyper activity disorder in children? *American Journal of Psychiatry*, 153, 1138–42

Editorial

13. Streissguth AP, Barr HM, Sampson PD, Bookstein F L Prenatal alcohol and offspring development: the first fourteen years. *Drug Alcohol Depend.* 1994 Oct; 36 (2): 89-99.

14. Gadow KD, Nolan EE, Litcher L et al. Comparison of attention deficit/ hyperactivity disorder symptom subtypes in Ukrainian school children. *J Am Acad Child Adolesc Psychiatry* 2000;39:1520-7.

15. Pineda D, Ardila A, Rosselli M et al. Prevalence of attention deficit /hyperactivity disorder symptoms in 4- to 17-year-old children in the general population. *J Abnorm Child Psychol* 1999;27:455-62

16. Pineda DA, Lopera F, Henao GC, Palacio JD, Castellanos FX; Grupo de Investigación Fundema. [Confirmation of the high prevalence of attention deficit disorder in a Colombian community]. *Rev Neurol.* 2001 Feb 1-15;32(3):217-22.

17. Nolan EE, Gadow KD, Sprafkin J. Teacher reports of DSM-IV ADHD, ODD, and CD symptoms in schoolchildren. *J Am Acad Child Adolesc Psychiatry.* 2001 Feb;40(2):241-9.

18. Pingali S, Sunderajan J. A study of comorbidities in attention deficit hyperactivity disorder: a retrospective analysis of case records. *AP J Psychol Med* 2014; 15 (2): 206-10

19. Palaniappan P, Seshadri S, Giriraji SC, Srinath S. Pattern of comorbidities in Indian children and adolescents with attention deficit hyperactivity disorder. *European Psychiatry* 2013;28:1

20. Taylor, E., Chadwick, O., Heptinstall, E., and Danckaerts, M. Hyperactivity and conduct problems as risk factors for adolescent development. *Journal of the American Academy of Child and Adolescent Psychiatry,* 1995; 35, 1213–26.

.....
How to cite this article?

Nazar FA, K. Suguna. Comorbidity & socioeconomic status associated with attention deficit hyperactive disorder. *Int J Pediatr Res.* 2018;5(5):300-305.doi:10.17511/ijpr.2018.i05.10.

.....