

# To Study the Prevalence of Parental ADHD in Children Newly Diagnosed with ADHD (Attention Deficit Hyperactivity Disorder)

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## ABSTRACT

Attention-deficit/hyperactivity disorder (ADHD) is a common neurobehavioral disorder. ADHD affects around 5% to 8% of school-age population globally. The objective was to study prevalence of parental ADHD in children newly diagnosed with ADHD. A sample size of 200 children between 8-15 years diagnosed ADHD by DSM V criteria, were randomly selected. DSM-V Criteria, Adult ADHD Self-Reporting Scale (ASRS1.1.), and case record form were used as tools in the study. The variables were analysed using non-parametric statistical tests. This study indicated that presence of parental ADHD only in fathers significantly increased the possibility of ADHD-C and decreased the possibility of ADHD-I in male probands. This study was statistically significant with a p value of 0.025. Parental ADHD is the major predictor in the longer outcome of the multimodal ADHD intervention measures. Hence the identification of these parents, treating them, and including them in family therapy is most important.

**Keywords:** Parental Attention deficit hyperactivity disorder, proband attention deficit hyperactivity disorder, Significant.

## INTRODUCTION

ADHD is one of the most common mental disorder affecting children and often continues into adulthood. It is a common neurobehavioral disorder of childhood. It is the most prevalent chronic health condition affecting school aged children. The prevalence of this disorder declines with increasing age. However it is estimated that around 4% of adults suffer from this disorder. Children with ADHD have increased risk of Antisocial Behaviour, Learning Disability (L.D.), Drug Abuse, Impaired Academic Performance, Communication Disorder (C.D.), and Speech Problems and Co-morbid Psychiatric Disorders. [10]

A recent meta-analysis study reported that ADHD persists from childhood into adulthood in 50-80% of the cases and that 40-45 % of ADHD affected children has at least one parent with ADHD. These children exhibit varied behavioural pattern depending on the types of ADHD and associated co morbidities. In adults residual signs of this disorder include impulsivity and attention deficit.

Although the prevalence of ADHD is thought to decrease with age these estimates suggest that ADHD is one of the most common adult psychiatric disorders. Various studies have shown that 8-12% of school going children have ADHD, amongst which majority have combined type. [1, 2]

Studies show that 18% of biological parents of proband had ADHD compared to 3% of biological parents of control and 6% of adoptive parents of proband ADHD. 16% mothers and 20.6% fathers had ADHD symptoms during their childhood. The presence of ADHD in either parent, especially the mothers constitute a significant risk factor for ADHD children. An etiology of ADHD is attributed to genetic factor in about 80%.<sup>[3,4]</sup>

Predisposing factors may include the child's temperament and genetic-familial factors. There may have been additional abnormalities in serotonin and cholinergic pathways. All twin studies of ADHD reported that the rate of concordance was significantly higher among monozygotic pairs (58%-82%) than same sex zygotic pairs (31%-38%) further proving that ADHD is significantly heritable.

In this study we investigated the prevalence of Parental ADHD in children diagnosed with ADHD. We also investigated the subtype of ADHD, prevalence of biparental ADHD in proband with ADHD and the role of gender, socioeconomic status in parental ADHD. We used ASRS questionnaire to screen ADHD of newly diagnosed ADHD child's parents.

## **MATERIALS & METHODS**

After taking clearance from institutional ethics committee we have carried out a prospective cross sectional study at paediatric neuro-developmental clinic in tertiary care hospital of metropolitan city.

We used DSM V criteria to diagnose ADHD in suspected children and ASRS (1.1) Adult ADHD Self Reporting System as a tool to evaluate parental ADHD.

The participants of the study were 200 newly diagnosed children with ADHD in the age group of 8-15 years based on DSM V criteria & their parents.

Children with ADHD and co morbid disorders such as SLD, CD and other emotional conditions, children with

congenital anomalies, neurological disease, intellectual disabilities and epilepsy were not included.

Data was analysed using statistical method. Data were entered in Microsoft Excel and analysed using Statistical Package for Social Sciences (SPSS), version 22 for Windows. We calculated the means and standard deviation for the linear variables, and proportion for the categorical variables. The means between the two groups were compared using the chi square test or the fisher's exact test. We also used logistical regression model for multivariate analysis to identify significant variables and to rule out potential cofounders. A p value of less than 0.05 was considered to be statistical significant.

## **RESULT**

In our study population of 200 newly diagnosed ADHD children, 164(82%) were males and 36(18%) were females with M: F ratio of 4.5:1. Majority [176(88%)] come from nuclear family structure and most of them belong to upper socioeconomic status. Most of the children were from the age group of 11-13years i.e. n=86(43%) and the mean age for ADHD-C (Attention Deficit Hyperactivity Disorder - Combined) and ADHD-I (Attention Deficit Hyperactivity Disorder - Inattentive) was 11.34 years and 11.97 years respectively.

Out of 200 newly diagnosed ADHD children, ADHD-C were 169 out of which 140(84%) & 29(80.6%) were males and females respectively, ADHD-I were 31 of which 24(14.6%) males and 7(19.4%) females. As per modified Kuppaswamy Scale majority belonged to upper class i.e., n=113 (56.5%). ADHD-I & ADHD-C were most common in upper class (n=28(24.4%) and lower class n=34(87.2%) respectively.

A total of 192 mothers and 187 fathers were screened out of which 22 fathers and 15 mothers screened positive for ADHD. Thus a total of 37 (18.5%) were screened positive for ADHD as per ASRS v1.1.

With reference to table 1, out of the 22 fathers whoever screened positive for ADHD, their children mostly belonged to the age group of 11 to 13years. However the possibility of having ADHD in the father was high in children belonging to the age group of 14 to15years. It was observed that 14 male children and 8 female children constituted the total 22 fathers with ADHD.

With reference to table 2, out of the 15 mothers whoever screened positive for ADHD, their children mostly belonged to the age group of 11 to 13years. However the possibility of having ADHD in the mother was high in children belonging to the age group of 14 to15 years. It was observed that 9 male children and 6 female children constituted the total 15 mothers with ADHD. It was seen that across the father's ADHD status group mean age of

male probands (12.57) were older than female probands (11.12) but across the mother's ADHD status there is negligible difference in the mean age of probands. Proband ADHD across the biparental ADHD showed statistical significance in gender ( $p=0.013$ ).

With reference to table 3, the Odds ratio indicated that the presence of paternal only ADHD significantly increased the possibility of ADHD combined subtypes and decreased possibility of inattentive subtypes in male probands and this study is statistically significant ( $p=0.025$ ).

With reference to table 4, significant difference in ASRS scores was present in parents with & without ADHD. The ratio of proband ADHD-I & ADHD-C for paternal & maternal ADHD were 1:10 and 1:2 respectively.

**Table 1: Distribution of age groups of ADHD proband as per fathers screened for ADHD using ASRS test.**

AGE GROUPS Of Proband	Fathers ASRS		Total n (%)
	Father Positive n (%)	Neither Positive n (%)	
8-10 years	6 (8.7%)	63 (91.3%)	69 (100.0%)
11-13 years	9 (11.1%)	72 (88.9%)	81 (100.0%)
14-15 years	7 (18.9%)	30 (81.1%)	37 (100.0%)
Total	22 (11.8%)	165 (88.2%)	187 (100.0%)
Chi-square =2.48		p = 0.289 (Not significant)	

**Table 2: Distribution of age group of ADHD probands as per mothers screened for ADHD using the ASRS test**

AGE GROUP of Probands	Mother's ASRS		Totaln(%)
	Mother positive n (%)	Neither positive n (%)	
8-10 years	5 (6.8%)	68 (93.2%)	73 (100.0%)
11-13 years	6 (7.3%)	76 (92.7%)	82 (100.0%)
14-15 years	4 (10.8%)	33 (89.2%)	37 (100.0%)
TOTAL	15 (7.8%)	177 (92.2%)	192 (100.0%)
Chi-square=0.50		p value=0.7	

**Table 3: Biparental ADHD status and pro-band characteristics**

Proband characteristics		Neither parent positive	Father positive	Mother positive	Both positive	P value
Proband gender.	Male	142	14	9	1	0.013
	Female	23	8	6	1	
Proband age (Mean)	ADHD-C	11.86	12.57	11.33	12	0.823
	ADHD-I	12.08	11.12	11.83	11	

**Table 4: Association of Biparental ADHD with proband ADHD subtypes**

Parental ADHD status	Proband Gender	Proband ADHD subtype	Adjusted for age (OR)	95% CI	P value
Only father positive	Male	ADHD-I (n=1)	0.138	0.011-1.738	0.025
	(n=14)	ADHD- C(n=13)			
Only mother positive	Female	ADHD-I(n=1)	0.056	Could not calculate	Could not calculate
	(n=9)	ADHD- C(n=8)			

## DISCUSSION

This cross-sectional study was performed to determine the prevalence of parental ADHD of children diagnosed with ADHD. It is one of the most common mental disorders affecting children and often continues into adulthood. It affects the interpersonal communication, academic performance, motor in- coordination, academic functioning, intelligence, social problems & accident-proneness. The onset of ADHD is usually 3 years of age but it is widely prevalent in preschool children.

In our study 200 newly diagnosed ADHD children aged between 8-15 years were enrolled. The result suggests that prevalence of ADHD was more common in male than in female with the M: F ratio of 4.5:1 in ADHD-C and 3.4:1 in ADHD-I respectively. This study was consistent with similar study done by Suvarna BS et al. [5] This lower ratio suggests that proportionally more boys with ADHD present to clinics. It has been suggested that the lower referral rates of ADHD girls may reflect a neglect of the problems experienced by girls with ADHD.

ADHD was more common in nuclear family i.e.; 156 (78%) which is consistent with study done by Venkatesh et al. [6] According to modified kuppuswamy scale 113 (56%) were from upper and 48 (42.4%) from middle & 39 (19.5%) from lower class. This finding was consistent with study done by Karande et al. [7] This reflects awareness, access & utilization of health services by upper & middle class. However compared to previous studies number of children enrolled from lower socioeconomic status have been increased due to increased exposure to social media and also health awareness.

It was found that the ADHD-C affected age group was 11-13 years and ADHD-I affected age group was 14-15 years. The mean age was 11.34 years in ADHD-C and 11.98 years in ADHD-I respectively, this finding was consistent with a study done by Karande et al. [7] However due to a referral sampling bias of

the study population, we got a higher number of older aged children. In this study we found that the trend of ADHD-I increases as age increases and ADHD-C type increases with age decrease, but the result was not significant.

The prevalence of Biparental ADHD was 37(18.5%) i.e.; either of the parents was positive for ADHD, as per the ASRS (Adult ADHD Self Reporting Scale). In a study done by Ruth Marshall et al [8] prevalence rate was 45.83%. The prevalence was lower in our study due to poor self-reporting or parents denying symptoms and poor understanding of questionnaire. We also studied prevalence of ADHD and its types in mothers and fathers separately and found that 22 (11.7%) with 17 (77%) ADHD-I and 05 (23%) in ADHD-C of 187 fathers, similarly 15 (7.8%) with 13 (87%) ADHD-I and 02 (13%) were ADHD-C out of 192 mothers. Similar study done by Martina Starck et al [9] also showed that ADHD was more prevalent in fathers than mothers.

We also studied parental ADHD in relation to age groups of children, which showed most of their children i.e. 40% belonged to age group of 11-13 years. But possibility of mother or father being ADHD is high in 14-15 years age group children. We also found that out of 22 fathers 14 (63.6%) were males and 8 (36.4%) were females, similarly out of 15 ADHD mothers 9 (60%) and 6 (40%) were males & females respectively. This suggests that possibility of mother being positive increases if child with ADHD is a girl.

Comparison of proband's ADHD gender with regards to parental ADHD status is found to be statistically significant ( $p = 0.013$ ). Across the fathers ADHD status group, mean age of male proband is 12.57 years were significantly higher than female, but there was negligible difference in mean age of probands across mothers ADHD. Similar study done by Toshinobu Takeda et al [11] showed opposite results to ours.

The mean ASRS scores of fathers ADHD was 41.18 and mothers ADHD was 41.33, which implies significant difference

in ASRS scores in parents with & without ADHD. The ratio of proband ADHD-I to ADHD-C was 1:10 for paternal ADHD & 1:2 in maternal ADHD. Probands with maternal-only ADHD had ADHD-Inattentiveness in most children, compared to probands with paternal-only ADHD.

Logistical regression analysis for each parental ADHD group was calculated & the Odds ratio (0.138) indicated that the presence of paternal only ADHD significantly increased the possibility of ADHD-C and decreased possibility of ADHD-I in male probands. This study was statistically significant ( $P=0.025$ ). Due to very small sample size maternal ADHD & female proband analyses could not be done. This study was consistent with study of Toshinobu Takeda et al [11] which had comparable odds ratio (0.34) for paternal & maternal only ADHD.

## CONCLUSION

Parental ADHD is a major predictor in the long term outcome of the multimodal ADHD intervention measures. Hence identification of these parents, treating them and actively including them in family therapy is of critical importance. So we recommend screening all the parents, siblings of ADHD children and if found positive, grade severity & plan treatment accordingly, especially in cases of an affected female ADHD child. We recommend ASRSv1.1 as a screening tool for parental ADHD as it is quick; the symptom severity can be graded and has a classification accuracy of 94%. Keeping in mind the rich diversity of culture and languages in our country we additionally recommend the development of adult self-reporting of ADHD questionnaire for better understanding and accurate analysis.

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## Declarations

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## REFERENCES

1. Goodman R, Stevenson J. A Twin Study of Hyperactivity-II. The Aetiological Role of Genes, Family Relationships and Perinatal Adversity. *J Child Psychol Psychiatry*. 1989;30(5):691–709.
2. Brown RT, Freeman WS, Perrin JM, Stein MT, Amler RW, Feldman HM, et al. Prevalence and assessment of attention-deficit/hyperactivity disorder in primary care settings. *Pediatrics*. 2001;107(3):E43.
3. Biederman J, Faraone S V. Erratum: Attention-deficit hyperactivity disorder (The Lancet (2005) 366 (237-248)). Vol. 367, Lancet. 2006. p. 210.
4. Biederman J, Faraone S V., Spencer T, Wilens T, Mick E, Lapey KA. Gender differences in a sample of adults with attention deficit hyperactivity disorder. *Psychiatry Res*. 1994;53(1):13–29.
5. Suvarna BS, Kamatha. Prevalence of attention deficit disorder among preschool age children. *Nepal Med Coll J*. 2009; 11(1):1–4.
6. Venkatesh C, Ravikumar T, Andal A VB. Venkatesh C, Ravikumar T, Andal A, Virudhagirinathan BS. Attention-deficit/Hyperactivity Disorder in Children: Clinical Profile and Co-morbidity. *Indian J Psychol Med*. 2012 Jan;34(1):34–8. *Indian J Psychol Med*. 2012;34(1):34–8.
7. Karande S, Satam N, Kulkarni M, Sholapurwala R, Chitre A, Shah N. Clinical and psychoeducational profile of children with specific learning disability and co-occurring attention-deficit hyperactivity disorder. *Indian J Med Sci*. 2007;61(12): 639–47.
8. Marshall R, Neill P, Theodosiou L. Prevalence of attention deficit hyperactivity symptoms in parents of children diagnosed with the condition. In: *Procedia - Social and Behavioral Sciences*. 2011. p. 3056–8.
9. Starck M, Grünwald J, Schlarb AA. Occurrence of ADHD in parents of

- ADHD children in a clinical sample. Neuropsychiatr Dis Treat. 2016;12:581–8.
10. Cantwell DP, Baker L. Association between attention deficit-hyperactivity disorder and learning disorders. J Learn Disabil [Internet]. 1991; 24(2):88–95. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/2010679>
11. Takeda T, Stotesbery K, Power T, Ambrosini PJ, Berrettini W, Hakonarson H, et al. Parental ADHD Status and its Association with Proband ADHD Subtype and Severity. J Pediatr. 2010;157(6).
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