

Prevalence and correlates of Attention Deficit Hyperactive Disorder (ADHD) risk factors among school children in a rural area of North India

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ABSTRACT

Background: Attention-deficit hyperactive disorder (ADHD) is one of the most common neurodevelopmental disorders of childhood and has the potential for continuity into adolescence and adulthood. Its presence increases difficulties in academic performance and social interactions besides leading to low self-esteem. The present study aimed to determine the prevalence of ADHD among children of age 6–12 years in Government schools of a rural area in Jammu district of J and K. **Methods:** The present study was conducted in R.S. Pura block of Jammu district. Miran Sahib zone of R.S Pura block was chosen randomly and all the government primary schools in this zone were included in the survey. The presence of ADHD was assessed using Vanderbilt ADHD diagnostic teacher rating scale. The children positive for ADHD were visited at their residential places and a personal information questionnaire (PIQ) was administered to their parents—preferably the mother. The data thus collected was presented as proportions. **Results:** ADHD prevalence was found to be 6.34% (13/205). Majority (69.3%) of the ADHD-positive children were living in a joint family and belonged to lower/lower middle class. Family history of ADHD was absent in all the ADHD-positive children. **Conclusion:** The current study conducted in a rural area among 6- to 12-year-old children of Government schools has shown a reasonably high ADHD prevalence of 6.34%.

Keywords: ADHD, prevalence, rural area, school children

Introduction

Mental illness is the leading cause of disability adjusted life years (DALYs) among all major diseases and conditions in the world.^[1] Mental and neurological disorders account for 14% of global burden of disease in the world and have profound impact on communities worldwide from social, cultural, and economic perspectives.^[2]

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An average of 3–4% of India's population suffers from major mental disorders.^[3] Data from the National Mental Health Survey (2015–2016) reveals that, in India, common mental disorders like depression, anxiety disorders, and substance use disorders are a huge burden affecting nearly 10.0% of the population. 1.9% of the populations were affected with severe mental disorders in their lifetime and 0.8% was identified to be currently affected with a severe mental disorders. Nearly 150 million Indians are in need of active interventions.

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ADHD (attention-deficit hyperactive disorder) is responsible for 0.06% of total years lost to disability (YLDs) and 0.02% of total DALYs. Majority of the burden due to ADHD occur in childhood; the magnitude of the burden attributable to ADHD needs the attention of policy makers in terms of early intervention and treatment.

ADHD is defined as by age inappropriate attention deficit, hyperactivity and impulsive behaviors usually seen in children of the same age or developmental level. ADHD becomes apparent in the preschool and early school years. Three major clinical subtypes of ADHD are recognized: predominantly inattentive (ADHD-IA), predominantly hyperactive/impulsive (ADHD-H/I), or a combination of these two subtypes (ADHD-C).^[4]

The prevalence of ADHD is highly variable worldwide, ranging from as low as 1% to as high as nearly 20%^[5] depending on the diagnostic criteria and the assessment tools used.^[6] With an estimated worldwide-pooled prevalence of 5.3%, ADHD is the most prevalent mental disorder in children. In India, the prevalence of ADHD has been reported to be 1.6–17.9%.^[7]

Extensive search on Pubmed revealed a paucity of data on ADHD from this part of India.

Materials and Methods

The present cross-sectional study was conducted in R.S Pura block of Jammu district of J&K state. The study was duly approved by the Institutional Ethical Committee (IEC) through letter no: IEC/T4c/2016/294 dated 7/10/2016.

R.S Pura block consists of eight health zones for the delivery of health services. Out of these eight health zones, Miran Sahib Health zone was selected randomly using the simple random sampling technique. The study was conducted for a period of one year extending from Nov 1, 2016 to Oct 31, 2017. All children aged 6–12 yrs and studying in the Govt. Primary Schools of Miran Sahib Health zone and were known for to the teachers for the past 6 months were included in the study. Children suffering from any other neurological disorder were excluded from the study.

Permission was sought from the Chief Education Officer, Jammu for the conduct of study in the Govt. Primary Schools of Miran

Sahib Zone in R.S. Pura block. The list of Govt. primary schools was procured and all the schools were covered in the study zone. The school teachers were interviewed using Vanderbilt ADHD diagnostic teacher rating Scale. Children positive for ADHD were singled out and their residential addresses were collected from the school. Then, their parents were contacted and administered personal information questionnaire (PIQ). The data thus collected was tabulated and analyzed. Chi-square test was used as the test of significance and *P* value < 0.05 were considered significant.

Results

During the course of the survey, 205 children (6–12 years) were registered, out of which 117 were males. ADHD prevalence was found to be 6.34% (13/205). There was higher prevalence of ADHD in males (76.9%) as compared to their female counterparts (23.1%) [Table 1].

The results have revealed that 69.3% (9/13) of the children suffering from ADHD were residing in joint families and were from lower middle class families. 53.8% (7/13) of the respondents had up to two siblings. Eleven out of the 13 children were living with both the parents and family history of ADHD was absent in all the 13 children [Table 2].

92.3% (12/13) of children had full-term duration of pregnancy and a normal vaginal delivery. Eleven of the respondents had institutional delivery and seven of them belonged to the first order by birth. Ten of these children had birth weight ≥ 2.5 kgs, 11 were breastfed, six were weaned at 3–6 months and 11 had normal milestones [Table 3]. Seven of these 13 respondents had ≥ 8 hours of sleep and a TV watching time of 1–2 hours.

Discussion

Prevalence of ADHD in the present study in rural primary school children was found to be 6.3% which is in agreement with the other studies conducted across different parts of India.^[8–11] Similar results have been obtained by some other authors from other parts of the world.^[12,13] Importantly, however, there is no uniform opinion on the prevalence rates and huge difference in prevalence reported by various studies have been found across the world. While El-Gendy SD *et al.*^[14] reported a higher prevalence of 21.8% and 16.2% of ADHD based on the teacher and parent scales, respectively, in primary school children aged

Table 1: Distribution of the various neurological disorders among the studied population after the administration of Vanderbilt scale (n=205)

Age group	ADHD positive (n=13) n (%)	Inattentive positive (n=10) n (%)	Hyperactive/impulsive positive (n=3) n (%)	Conduct disorder (n=10) n (%)	Anxiety disorder (n=5) n (%)
6 to ≤ 8	6 (46.1)	3 (30)	0 (0.0)	3 (30)	3 (60)
8 to ≤ 10	4 (30.8)	2 (20)	1 (33.3)	3 (30)	1 (20)
10 up to 12	3 (23.1)	5 (50)	2 (66.6)	4 (40)	1 (20)
Overall prevalence (95% CI)	13 (6.3) (3.74-10.55)	10 (4.8) (2.67-8.74)	3 (1.4) (1.66-6.87)	10 (4.8) (2.67-8.74)	5 (2.4) (1.04-5.58)

Table 2: Distribution of patients with ADHD with regards to sociodemographic factor (n=13)

Sociodemographic factor	ADHD POSITIVE n (%)
Type of family	
Nuclear family.	4 (30.7)
Joint family.	9 (69.3)
Family size (no. Of brothers and sisters)	
1 to 2.	7 (53.8)
3 to 4	5 (38.5)
≥5	1 (7.7)
Family H/O of ADHD	
Present.	0 (0.0)
Absent.	13 (100)
Living with both parents.	
Both parent.	11 (84.6)
Single parent.	2 (15.4)
Socio-economic status.	
Upper class.	0 (0.0)
Upper-middle class.	0 (0.0)
Middle class.	4 (30.8)
Lower-middle class.	5 (38.4)
Lower class.	4 (30.8)

Table 3: Pre- (maternal) and postnatal (maternal and child's) factors associated with ADHD (n=13)

Pre- (maternal) and postnatal (maternal and child's) factor	ADHD POSITIVE n (%)
Duration of pregnancy	
Full-term	12 (92.3)
Pre-term	1 (7.7)
Type of delivery	
Normal	12 (92.3)
Caesarean	1 (7.7)
Place of delivery	
Institutional	11 (84.6)
Domiciliary	2 (15.4)
Birth order	
1 st	7 (53.9)
2 nd	4 (30.8)
3 rd	2 (15.3)
≥4 th child	0 (0.0)
Birth weight (Kgs.)	
≤2.5	3 (23.1)
≥2.5	10 (76.9)
Type of feeding	
Breast-feeding	11 (84.6)
Bottle-feeding	2 (15.4)
Time of weaning	
≤3 months	5 (38.5)
3-6 months	6 (46.1)
≥6 months	2 (15.4)
Child milestones	
Before time	0 (0.0)
On time	11 (84.6)
Delayed	2 (15.4)

6–12 years, EL-Nemr FM *et al.*^[15] and Safavi P *et al.*^[16] reported higher prevalence rates of 19.7% and 17.3% in their respective studies. Similarly, Suvarna BS *et al.*^[17] reported a higher prevalence

of 12.2% of ADHD in children aged 4–6 years in Southwest Mumbai, India, Ramya HS *et al.*^[18] and Mannapur R *et al.*^[19] have reported a lower prevalence of 1.3% and 2.3% of ADHD in their respective studies.

What exactly accounts for difference in the results? Is there really a pattern to this differential distribution or are these varied results merely an exaggeration due to the use of different diagnostic criterion and assessment tools. Identifying the true prevalence will require uniform application of data collection and interpretation tools after following standardized methodologies.

Sex-wise prevalence of ADHD was found to be high in male children and the ration was 3:1 in the present study. These results are consistent with the results reported by others.^[9,19,20] Generally speaking, ADHD is more commonly diagnosed in boys than girls, but research into ADHD in adulthood suggests an almost equal prevalence between men and women. A few theories have been advanced to provide a reason for this. One possibility is that girls are in some way “protected” from developing ADHD and so it takes a higher burden of risk factors than in boys for girls to develop problems. Another possibility is that ADHD symptoms are missed in girls or that mental health problems in girls develop into problems other than ADHD.

Some of the common risk factors attributed to occurrence of ADHD include: Blood relatives, such as a parent or sibling, with ADHD or another mental health disorder, exposure to environmental toxins—such as lead, found mainly in paint and pipes in older buildings, maternal drug use, alcohol use, or smoking during pregnancy, and premature birth. When we analyzed the outcomes in our study for possible correlates of ADHD, we found 69.3% of the ADHD-positive children were living in a joint family. These results are in contrast to the findings of Venkatesh C *et al.*^[21] who reported that ADHD was more common in children belonging to nuclear families. Therefore, family type (joint or nuclear) may not be one of the correlates for ADHD. Interestingly, however, none of the ADHD-positive children in our study had ADHD-positive family history, which was also in contrary to the results reported by Venkatesh C *et al.*^[22] Family did not seem to be a contributing factor as more than half of the ADHD-positive children in the current study were having a 1–2 siblings, with 84.6% of ADHD-positive respondents living with both the parents.

Again, interestingly majority (92.3%) of ADHD positives in the current study had full-term duration of pregnancy with more than half of the ADHD positives belonging to the first birth, 76.9% of ADHD positive children had a birth weight >20.5 kg. Therefore, prematurity does not appear to be a cause as per our study.

Establishing the cause for ADHD may be difficult, given in the diversity in the results reported by studies. Using a standardized nationally representative sample may help answer the query. Importantly, family physicians are often the first point of contact for families of children and youth with conditions like ADHD.

A large majority of patients with these conditions are diagnosed and treated in community clinics. Residency training programs for family physicians must incorporate behavioral, developmental, and mental health training including ADHD diagnosis and treatment among its explicit learning objectives and take measures to ensure this objective is being met.^[23]

Limitations

The current cross-sectional study with a small, homogeneous sample with a possibility of recall bias may lack generalization.

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Conflicts of interest

There are no conflicts of interest.

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