

## Original Articles

### **A descriptive study of attention deficit hyperactivity disorder (ADHD) at Lady Ridgeway Hospital for Children, Colombo**

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#### **Abstract**

**Objectives** To determine:

- Frequency of ADHD among referrals to Child Psychiatry and Guidance Clinics (CPGC) of Lady Ridgeway Hospital (LRH).
- Associated neuropsychiatric disorders.
- Social problems experienced by affected children and their families.
- Compliance to methylphenidate (MPD) treatment.

**Design** A descriptive prospective study.

**Method** Diagnosis was made according to DSM-IV criteria using a validated Sinhala assessment form. Statistical analysis was done with 1-way ANOVA.

**Results** 37 children attending CPGC at LRH had ADHD. There was a male preponderance. Mean age was 6.5 years. Learning disorders and obsessive compulsive disorders / behaviours were commonly associated neuropsychiatric conditions. 'Often receiving complaints from school' was a significant social problem for ADHD children and their families. MPD treatment helped with school related problems in the short- term, but there was no improvement in academic performance. Beneficial effect of MPD, given for six months, was not convincing and there was poor compliance, mostly due to inadequate improvement in symptoms.

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#### **Introduction**

Age inappropriate inattention, hyperactivity and impulsivity characterize Attention Deficit Hyperactivity Disorder (ADHD), predominantly seen in childhood. Diagnostic and Statistical Manual, 4th Edition (DSM-IV) criteria for ADHD1 include:

- A list of behaviours and characteristics that appear related to inattention, hyperactivity or impulsivity.
- Onset of characteristic behaviour symptoms before seven years of age.
- Presence of some impairment in symptoms from 2 or more settings (e.g. in school and at home).
- Presence of clear evidence of clinically significant impairment in social, academic or occupational functioning.
- Symptoms not occurring exclusively during course of a pervasive developmental disorder, schizophrenia or other psychotic disorder and not better accounted for by another mental disorder.

The diagnostic criteria set forth in the DSM-IV are from periodic revisions done over years in response to epidemiological research.

Despite years of clinical research and experience, aetiology of ADHD remains speculative. There are no documented strategies for its prevention. Although there are several hypotheses on its pathogenesis, none satisfactorily account for all known cases. ADHD is defined purely behaviourally, without a specific biological marker, thus generating a lot of controversy about the disorder.

Symptoms of ADHD have serious implications on affected child's relationships at home and at school. ADHD has been noted to be co-morbid with a variety of neuropsychiatric conditions such as tic disorder,

obsessive compulsive disorder, oppositional defiant disorder, conduct disorder and learning disorder<sup>1</sup>. These disorders also cause disruptive behaviours in children. Therefore effective management of ADHD is important to affected child as well as to society in which child lives.

According to available literature ADHD does not exclude any social class or ethnic group and there has been a worldwide increase in its incidence, as well as in prescription of CNS stimulants for its treatment, over past decade<sup>2,3</sup>. However there are no studies on prevalence of ADHD in Sri Lanka. Some children, excluded from schools and in probation and childcare centres or prisons in Sri Lanka, may be having ADHD. Therefore we thought it is important to determine to what degree ADHD affects child population in Sri Lanka and its impact on their families.

ADHD symptoms that should improve with effective management include hyperactivity, attention span, impulsivity, social interactions with peers, teachers and parents, and academic productivity.

Psychostimulants (PS) are first line drugs in management of ADHD<sup>4</sup>. Methylphenidate (MPD) is the PS available in Sri Lanka and the one most widely used world-wide. Though long-term effects of PS remain in doubt, MPD is advocated as a long-term treatment.

**Objectives** To determine:

- Frequency of ADHD among referrals to Child Psychiatry and Guidance Clinics (CPGC) of Lady Ridgeway Hospital for Children (LRH).
- Associated neuropsychiatric disorders present in ADHD children.
- Social problems experienced by affected children and their families.
- Compliance to MPD treatment.

### **Study Design**

Descriptive prospective study.

### **Method**

A letter was sent to Consultant Paediatricians, giving the DSM-IV criteria for diagnosing ADHD, and requesting them to refer any children, whom they suspected of having ADHD, to the CPGC run at LRH. Ethical clearance for the study was obtained from the faculty of medicine, University of Kelaniya.

All children who presented to CPGC at LRH from 1st January-31st December, 2000, with features related

to inattention, hyperactivity or impulsivity, were assessed together with a Consultant Psychiatrist. ADHD was diagnosed using a validated Sinhala assessment form based on DSM-IV criteria. According to above criteria, a minimum severity score of 12 from assessment form is necessary for symptoms of inattention or hyperactivity-impulsivity to diagnose ADHD. Consenting parents or guardians, who took care of the ADHD children, completed these assessment forms. Assessment forms were also sent to class teachers of all schooling children, for completion, to make sure that symptoms were present in school setting as well. Associated neuropsychiatric disorders were also diagnosed according to DSM-IV criteria with clinical history and examination.

Data on social problems experienced by diagnosed children and their families were obtained using an interviewer-administered questionnaire. Presence of social problems was reassessed 6 weeks and 6 months after starting treatment.

Children diagnosed to have ADHD during study period were managed as out patients of the respective clinics. They were followed up according to needs and were given clinic appointments at least once a month. MPD dose for each child was determined by a Consultant Psychiatrist. They were started on 5 mg once or twice daily and the dose altered at weekly or longer intervals considering therapeutic response and adverse effects reported. The caring parents and guardians were educated on managing child's behaviour.

Compliance to treatment was determined by clinic attendance, assessed at six weeks and six months of treatment. Parents of ADHD subjects not attending clinic six months after starting treatment were contacted over phone, by letter or through social worker, to find out reasons for defaulting treatment.

Statistical analysis was done with 1-way ANOVA.

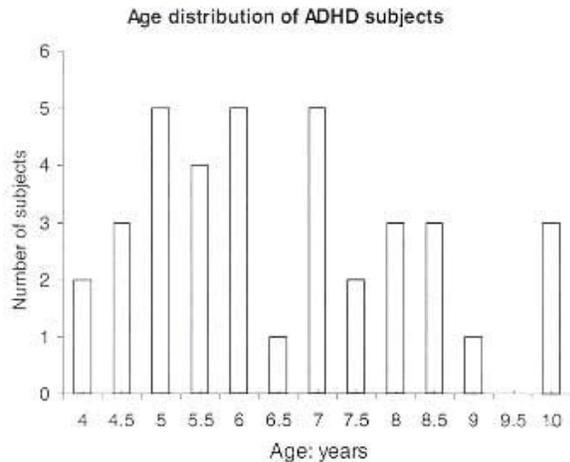
### **Results**

#### ***Frequency of ADHD in children presenting with behaviour problems to CPGC***

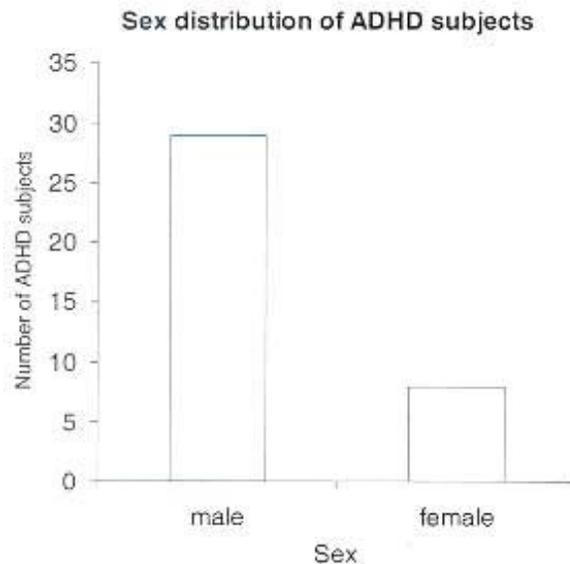
Total number of children registered in CPGC of LRH in year 2000 was 517. Number of children detected to have ADHD, according to DSM-IV criteria, was 37.

Figure 1 shows age distribution of ADHD subjects. Average age was 6.5 years (range: 4 -10 years).

Figure 2 shows sex distribution of ADHD subjects. Male: female ratio was 3.6:1.



**Figure 1.** Age distribution of ADHD subject: Y-axis shows the age in years to the closest half year and the X-axis shows the number of ADHD subjects (N=37)



**Figure 2.** Sex distribution of ADHD subjects, X-axis shows the sex and the Y-axis shows the number of children affected from each sex (N=37)

**Associated neuropsychiatric disorders in ADHD children**

Table 1 shows associated neuropsychiatric disorders detected in ADHD subjects.

**Table 1**  
**Associated neuropsychiatric disorders detected in ADHD subjects**

Neuropsychiatric disorder	Number affected	% from total (N=37)
Conduct disorder	2	5
Learning disorder	6	16
Obsessive compulsive disorder / behaviours	5	13.5
Oppositional defiant disorder	1	2.5
Tourette syndrome	3	8
Chronic motor tics	1	2.5

**Compliance to MPD treatment shown by clinic attendance**

Of the 37 ADHD subjects 36 were started on MPD and one, having associated Tourette syndrome with severe tics, was treated with haloperidol and imipramine.

The clinic attendance of ADHD subjects is shown in Table 2.

**Table 2**  
**Clinic attendance of ADHD subjects**

Clinic attendance	Number of subjects	% of total subjects (N=37)
regularly up to 6 weeks	31	83.8
regularly up to 6 months	20	54.1

Reasons given by parents for defaulting treatment, when contacted 6 months after initiating treatment, are shown in Table 3.

**Table 3**  
**Reasons given by parents for defaulting treatment**

Reason	Number of ADHD subjects	% of the total defaulted (N=17)
No improvement in symptoms	10	58.8
Child refuses to take the drug	1	5.8
Poor night sleep	3	17.6
Developed severe loss of appetite due to MPD	2	11.8
Mother stopped as child is better	1	5.8

**Identified Social problems and their frequency among ADHD subjects**

Social problems identified on initial assessment and

their frequency among ADHD subjects are shown in Table 4.

**Table 4**  
**Social problems identified and their frequency among ADHD subjects at initial assessment**

<i>Social Problem</i>	<i>Frequency</i>			<i>Number &amp; % often receiving complaints</i>
	<i>Number schooling</i>	<i>Number excluded</i>	<i>Number not admitted</i>	
<i>Often receive complaints from school</i>	34	2	1	29 (85.3%)
Poor relationships with siblings	Number with sibs 27			Number & % with poor relationships with sibs 25 (92.6%)
Problems with neighbours	Number with contacts 28			Number & % with problem 21 (75%)
Adverse effects on education of siblings	Number with schooling sibs 24			Number & % affected 19 (79%)
Marital disharmony of parents	Number with both parents 34			Number'& % with problems 10 (28.6%)
Family economy/ parent's employment affected	Number living with families 37			Number & % affected 17 (46%)

Frequency of different social problems detected, other than that of often receiving complaints from school, did not show a statistically significant difference 6 weeks and 6 months after treatment (1-way ANOVA).

Table 5 shows frequency of parents reporting as "often receives complaints from school" at different assessments (initial, 6 weeks and 6 months). Frequency was significantly different between 1<sup>st</sup> and 2<sup>nd</sup> and 1<sup>st</sup> and 3<sup>rd</sup> assessments, but not between 2<sup>nd</sup> and 3<sup>rd</sup> assessments (1-way ANOVA).

**Table 5**  
**Frequency of parents reporting as 'often receive complaints from school' at different assessments**

<i>Number &amp; % often receiving Complaints</i> <i>(1<sup>st</sup> ass., N=37)</i>	<i>Number &amp; % often receiving Complaints</i> <i>(2<sup>nd</sup> ass., N=31)</i>	<i>Number &amp; % often receiving Complaints</i> <i>(3<sup>rd</sup> ass., N=20)</i>
29 (78.4%)	8 (25.8%)	5 (25.0%)

Of the 37 children included in study one child has been excluded from school by the time of diagnosis and could not recommence school even after 6 months of MPD therapy. While on MPD therapy at 6 weeks another child is reported to have been excluded from school and at 6 months of MPD therapy one child who reported as 'often receiving

complaints from school' was asked to leave school till his behaviour improves.

All parents, without exception, reported that there was no improvement in academic performance with MPD.

## Discussion

Paediatricians from different parts of Sri Lanka referred the subjects in this group. 37 children who attended CPGC at LRH were diagnosed to have ADHD. In USA 50% children attending child psychiatry clinics and 5% school children have ADHD<sup>5</sup>. Although this study confirms that ADHD is a problem in Sri Lankan children, it does not reflect its true incidence. Children in this cohort came from different parts of Sri Lanka finding their travelling costs with difficulty. Some children were supported by local organizations for their travel to LRH. There may be many children suffering from ADHD, branded as 'naughty children' who have not been directed for assessment to a paediatrician or psychiatrist. A few are diagnosed and managed at the Peradeniya Teaching Hospital and a few may be managed in general hospitals out of Colombo and in the private sector. Therefore the real incidence of ADHD in Sri Lanka is higher than what is detected at LRH. To determine real incidence, a house-to-house survey must be done, directing suspected children for diagnosis by trained personnel.

The ADHD subjects showed a male preponderance as is generally seen in ADHD<sup>1</sup>. Age range of diagnosed children was 4-10 years with a mean of 6.5 years. In this group, learning disorders and obsessive compulsive disorder / behaviours were the commonly associated neuropsychiatric conditions and oppositional defiant disorder was uncommon.

'Often receiving complaints from school' was a significant social problem for both ADHD children and their families. Number of subjects who reported as 'often receiving complaints from school' showed a statistically significant reduction between first and second and first and third assessment but not between second and third assessments. These findings suggest that there is a small contribution of MPD towards improving schooling of ADHD children. Frequency of other social problems did not show a significant difference between assessments suggesting that MPD therapy was not helpful in reducing the common social problems associated with ADHD.

MPD helped with school related problems in the short-term, but all parents specifically reported a lack of improvement in academic performance following commencement of MPD treatment, further establishing the fact that MPD does not improve academic performance<sup>6</sup>. MPD affects all children similarly and is not specific for children with ADHD<sup>7</sup>. Thus, response to MPD is not diagnostic of ADHD. School performance is usually poor in

ADHD children, without an associated learning disorder, even if they have a high IQ. Most children with ADHD concentrate on and do tasks that interest them<sup>5</sup>. Therefore it is important for teachers and parents to identify such tasks and develop them for benefit of child e.g. painting, making models etc. For children with ADHD of predominantly inattentive type, giving one to one attention in educational activities may be helpful.

Only 57% subjects, started on MPD therapy, attended clinic up to 6 months. 60% parents of defaulted subjects gave lack of improvement of symptoms as reason for default. Beneficial effect of MPD was not convincing in this group of subjects and they showed poor compliance, mostly due to inadequate improvement in symptoms. 20-25% of those who respond poorly to one medication may respond positively to another<sup>8</sup>, but in Sri Lanka MPD is the only PS available and there is no alternative to try on poor responders to MPD.

Anorexia is a recognised adverse effect of MPD and in two treatment defaulters, reason given by parent for default was severe loss of appetite. Growth retardation in children is another recognised adverse effect and regular growth monitoring must be done in children on MPD. PS supposedly precipitate or exacerbate tics in children. Tics may occur 1 week to 24 months after PS administration. It is rare for tics to persist after discontinuation of medication<sup>9</sup>. This was the reason for not using MPD in a child with Tourette syndrome with severe tics in this cohort. MPD may lower convulsive threshold in patients with a history of seizures, with prior EEG abnormalities in absence of seizures and rarely, in absence of history of seizures and no prior EEG evidence of seizures<sup>10</sup>.

When immediate release ordinary tablets of MPD are given, onset of action is in 20-60 minutes and effect lasts for about 3-6 hours<sup>4</sup>. Inadequate improvement seen by parents may be due to MPD's relatively short duration of action. Dosing MPD to achieve effects while child is in school is a common practice by child psychiatrists to reduce complaints from school. With these results we suggest that affected children and parents should be educated not to expect too much from stimulant medications, including MPD, but to use alternative strategies like behaviour therapy and social support systems to the maximum, to continue education of these children and prevent them being a burden to themselves and society. Results of this study further emphasize lack of benefit in making MPD available in more hospitals without making available facilities for proper behaviour therapy and social support.

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