ABSTRACT

Background: Attention deficit hyperactivity disorder (ADHD) is a common childhood mental health disorder. Treatment has shown to improve both short and long-term prognosis. Hence, study of factors leading to nonadherence is undertaken. Objective: The objective was to know the rate of nonadherence and factors affecting nonadherence. Setting and Design: Cross-sectional follow-up study at child guidance clinic in a tertiary health care facility. Materials and Methods: Forty children with a diagnosis of ADHD initiated on treatment either combined or nonpharmacological were followed-up and checked for nonadherence. Factors leading on to nonadherence were assessed. Statistics: By SPSS 16.0 and Epi info. Results: Rate of nonadherence was 62.5%. 75.7% of nonadherence contributed by social factors. Delivery by caesarean predicted nonadherence. Age of diagnosis and baseline severity did not have an effect on adherence. Conclusion: Rate of nonadherence to treatment was low compared to other Indian studies. Social factors mainly implicated for nonadherence. An effort for education and information of the society about ADHD is needed.

Key words: Adherence, attention deficit hyperactivity disorder, treatment

INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) is one of the most common childhood mental health conditions. The etiology of ADHD is recognized as multifactorial. The genetic contribution is shown to be about 75-90% in various twin studies. The rest is attributed to environmental factors which can be shared or nonshared. Research has shown that children with this disorder experience significant impairment in psychosocial functioning such as higher rates of academic difficulties, early school departure, and co-existing psychiatric conditions. Even though traditionally thought to be a disorder of childhood, in about 50% cases persist into adolescence and adulthood. This can lead to poor educational performance, more psychosocial maladjustments, frequent changes in employment and risky driving. Hence, identification and treatment of the condition is of primary concern.

In the U.S., the prevalence of ADHD among school aged children is about 2-20%. The male to female ratio was 2-9:1. The prevalence rate of ADHD according to a study done among psychiatric outpatient population was 17.7%. Research has shown that ADHD is amenable to treatment which includes pharmacotherapy, behavioral therapy and or parental training or combination. It has been proven that poor compliance may lead on
to suboptimal symptom management and less than favorable outcomes. Western literature has shown a wide range of adherence to stimulant medication ranging from 35% to 87%.[8] The main factors identified as affecting adherence in these studies were male gender, adolescent age, severe symptoms, associated oppositional defiant disorder (ODD), lower socioeconomic status, multiple medication, parental opposition, side effects, and lack of perceived benefit. Various Indian studies have shown an adherence of 11.3-16.7% which is much lower compared to western studies.[8] Various socio cultural and economic factors specific to Indian context like opposition from others in the family and other medical practitioners, problems in hospital procedures, cost and difficulty in obtaining medications and ADHD not being the primary concern of the parents were identified in these studies. Hence, the present study was undertaken to:

1. Identify the prevalence rate of ADHD among children attending the Child and Adolescent Guidance clinic at Government Medical College, Kottayam.
2. The rate of adherence to treatment in children diagnosed with ADHD.
3. The primary factors affecting adherence to treatment in clinic children with ADHD.

MATERIALS AND METHODS

Study period
January 1, 2013-2030th June 2013.

Inclusion criteria
1. Children attending child guidance clinic (CGC) with a diagnosis of ADHD according to diagnostic and statistical manual of mental disorders, fourth edition text revision (DSM IV TR).
2. Parents opting for treatment and giving consent for inclusion into the study.

Exclusion criteria
1. Children having mental retardation and physical disability.
2. Children with diagnosis of ADHD already on treatment.
3. Parents unable to give a coherent history.

All children newly registered in the CGC in the study period and with a diagnosis of ADHD according to DSM IV TR were included in the study after obtaining the consent from the primary caretaker (parent or the guardian of the child). A specially designed intake Pro Forma which includes the subtype of ADHD was filled after the initial assessment. Severity of the condition was rated on clinical global impression severity (CGI-S) scale. Psychoeducation about the illness, its etiology, prognosis and various treatment options available including the benefits and side effects are given to the primary caretaker. According to the choice of the primary caretaker, the child is started on combination therapy (both pharmacotherapy and behavioral therapy) or behavioral therapy alone. Pharmacotherapy includes either methylphenidate (0.3-1 mg/kg/day) or clonidine (3-6 µg/kg/day). Behavioral therapy was based on Barkley manual and primary caregiver was instructed to bring a daily report on the activities of the child on the next appointment. Revisit is scheduled at 2 weeks interval.

Nonadherence was defined as when the child is taking <80% of the prescribed medication or when not visiting clinic within 2 weeks of the scheduled appointment with the progress report on the child’s activities.

Adherence was assessed by report of the child or parent about medication, assessment of the report of the child’s activities and from the clinical records for assessing the subject’s adherence of appointments.

Primary care giver of subjects who were not reporting for follow-up appointments even after 2 weeks of schedule appointment was contacted over phone and a check list of factors which could be the possible reasons for nonadherence were administered and the response noted.

A special Pro Forma was developed for this study for collection of data. Any birth complications if present were noted so do any co morbidities. Type of management opted by the primary care giver was noted and also whether the subject was compliant or not.

Specific check list of factors affecting treatment adherence was developed. This was developed based on a similar study by Sitholey et al.[8] The factors were divided arbitrarily into treatment related and social factors for the ease of administration. The CGI-S was administered at baseline and severity was rated from 0 (assessment not possible) to 7 (patient extremely ill).

Statistical analysis was done by SPSS 16.0 and Epi info.

RESULTS

Table 1 summarizes the clinical variables of the study subjects. Of the forty subjects who participated in the study, 33 (82%) were males and 7 (18%) were females. The mean age of males was 8.03 years and females was 7 years. 72.5% had an age of above 5 years. 21 (52%) were referred from the pediatrics department and 14 (32%) from schools.
Combined subtype contributed to 60% of the total subjects. There was no hyperactive/impulsive subtype in <5 years age and among females. 52.5% did not have co morbidity. Among the co morbidities, identified majority was specific learning disorder (SLD) and ODD with each seen in up to 17.5%. Majority of the co-morbidities (73.7%) was seen in the above five age. 85.7% of co morbidities were in males. 63% did not have any obstetric complications. 5 (45.4%) of the inattentive subtype had obstetric complications. 60% of the subjects with expressive language disorder had obstetric complications. 47% of subjects with co morbidity were adherent compared to 28% without co morbidity.

Majority opted for nonpharmacological treatment. Among females, 85% opted for nonpharmacological management compared to 57% of males. 3 (60%) of hyperactive/impulsive subtype subjects opted for combined treatment. 26% with obstetric complications opted for combined treatment compared to 47% without obstetric complications.

The adherence rate was 37.5% with 15 subjects coming for schedule follow-up. In both <5 and above 5 years 37% were adherent to treatment. Among those who were nonadherent, 85% were females and 57% were males. Inattentive subtype was the most adherent (45.4%), and least was seen with hyperactive/impulsive subtype (20%). 46.6% of those with obstetric complications were adherent. There was more chance of nonadherence in these subjects in subjects delivered by caesarean. Fisher exact test was used in the analysis which gave a \( P = 0.034 \) which is significant. 46% of those who opted for combined treatment were adherent compared to 32% of those with nonpharmacological treatment.

Among the social factors opposition by others (32%) and lack of parental will (28%) were the most sited reasons for nonadherence. Nonadherence on the part of the child was more common on male (80%) compared to females. Figure 1 gives a comparison of social factors in both males and females.

Most sited treatment-related factor was lack of effect (37%) and was seen in male subjects. A comparison of treatment-related factors in both sexes is given in Figure 2. Social factors contributed to 75.7% of nonadherence.

### Table 1: Clinical variables of the subjects

| Variables         | Number | Percentage |
|-------------------|--------|------------|
| Age               |        |            |
| <5                | 11     | 27.5       |
| >5                | 29     | 72.5       |
| Sex               |        |            |
| Male              | 33     | 82         |
| Female            | 7      | 18         |
| Source of referral|        |            |
| Pediatric         | 21     | 52.5       |
| School            | 14     | 35         |
| Other specialties | 5      | 12.5       |
| Subtype           |        |            |
| Combined          | 24     | 60         |
| Inattentive       | 11     | 27         |
| Hyperactive/Impulsive | 5   | 13         |
| Co morbidity      |        |            |
| No morbidity      | 21     | 52.5       |
| SLD               | 7      | 36.8*      |
| ODD               | 7      | 36.8*      |
| ELD               | 5      | 26.3*      |
| Birth complications|       |            |
| Yes               | 15     | 37         |
| No                | 25     | 63         |
| Type of complication|      |            |
| LSCS              | 9      | 60*        |
| Low birth weight  | 5      | 33*        |
| Preterm           | 1      | 7*         |
| Type of management|        |            |
| Combined          | 15     | 37.5       |
| Non pharmacological| 25  | 62.5       |
| Adherence         |        |            |
| Yes               | 15     | 37.5       |
| No                | 25     | 62.5       |

*percentage calculated from subject with co morbidity & complications; SLD – Specific learning disorder; ODD – Oppositional defiant disorder; ELD – Expressive language disorder; LSCS – Lower segment cesarean section.
DISCUSSION

The prevalence of ADHD in the children attending the outpatient clinic is 34.8% for the study period. Among the subjects, the male to female ratio was 4.7:1 which was similar to other Indian studies. The mean age of males was 8.03 and females was 7 years, similar to that of other Indian studies. In our sample, majority of the referral were from the pediatrics department (52%) which was lesser than other studies. About 32% referral were from schools. This shows a general trend of increased awareness among teachers about the illness.

The predominant subtype in western studies was inattentive subtype, but in our study, the most predominant subtype was combined subtype which constituted 60%. Subjects with co morbidity had increased the chance of adherence. Among females, majority opted for nonpharmacological treatment. This may be due to the parental attitude, social stigma and low incidence of disruptive behavior associated with females. The presence of obstetric complications predicted a less chance to opting for pharmacological treatment. Hyperactive/impulsive subtype predicted an increased chance of opting for pharmacological management. This may be due to the increased risk of disruptive behavior associated with this subtype.

About 37% of the study population had obstetric complication which was against the findings in other studies that low birth weight and cesarean were significant risk factors for ADHD. Subjects with co morbidity had increased the chance of adherence. Among females, majority opted for nonpharmacological treatment. This may be due to the parental attitude, social stigma and low incidence of disruptive behavior associated with females. The presence of obstetric complications predicted a less chance to opting for pharmacological treatment. Hyperactive/impulsive subtype predicted an increased chance of opting for pharmacological management. This may be due to the increased risk of disruptive behavior associated with this subtype.

The adherence rate in our study sample is 37.5% which was higher compared to previous Indian studies. Rate of adherence did not depend on the age which was against the findings of the previous studies. Majority of the females were nonadherent which was against the findings of the previous western studies. Inattentive subtype was the most adherent. This may be due to the perceived benefit and easy implementation of treatment in this subtype.

Delivery by caesarean was a risk factor for nonadherence. This was statistically proven. This may be due to the perceived belief of the society that these children must not be given much medications or due to the over involvement of the part of the parents. Subjects who opted for pharmacological treatment were more compliant. This may reflect the higher benefit for the patients started on pharmacological treatment.

The severity of illness at baseline did not predict the adherence to treatment which was against the finding of the previous study.

The most common treatment related factor contributing to nonadherence was lack of effect of the treatment. Social factors contributed to the majority of nonadherence that is, 75.7%. Opposition by others was the main social factors for nonadherence which was seen in about 30% similar to other Indian studies. In our study the second social factor was the lack of parental will, was lesser than that in other Indian study and western study. Refusal on the part of the child was mainly seen in males. This may be due to the presence of more combined and hyperactive/impulsive subtype among males the need for taking the child also into consideration while giving psycho education. The finding that social factors contribute to the majority of nonadherence reflects the need for more information and education of the society about the illness and the need for treatment and the type of treatments available.

CONCLUSION

The study shows that the clinical population which was studies had a higher adherence rate. Social factors contributed to the majority of the nonadherence. The sample size of the study was small. Hence, generalization of data is not possible. Hence, it emphasizes the need for more education of the society regarding the illness, information about the available treatment options, and the advantages of treatment.

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