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Case Report

Attention deficit hyperactivity disorder improved with Methylphenidate: a case report

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Abstract

Background: Attention deficit hyperactivity disorder (ADHD) is a neurobehavioral disorder characterized by either significant difficulties of inattention or hyperactivity and impulsiveness or a combination of the two. **Objective:** The case was discussed because its symptoms can be difficult to differentiate from other disorders, increasing the likelihood that the diagnosis of ADHD will be missed and with proper treatment, kids with ADHD can learn to successfully live with and manage their symptoms. **Result:** After 6 months of treatment with methylphenidate, the patient started to improve and at the end of 2 years he became a communicative boy, making good school progress with occasional setbacks. **Conclusion:** ADHD is often under diagnosed in children. So, early diagnosis and treatment is very important for prevention of long-term effects.

Key words: Attention; Deficit; Hyperactivity.

INTRODUCTION

ADHD is diagnosed in about 2% to 16% of school-aged children.[1] Kids with ADHD act without thinking, are hyperactive, and have trouble in focusing. They may understand what is expected of them but have trouble following through because they cannot sit still, pay attention, or attend to details.[1,2] Of course, all kids (especially younger ones) act this way at times, particularly when they are anxious or excited. But the difference with ADHD is that symptoms are present over a longer period of time and occur in different settings. They impair a child's ability to function socially, academically, and at home. Standardized rating scales can be used for ADHD screening and assessment of the disorder's symptoms' severity.[3] ADHD management usually involves some combination of medications, behaviour therapy, lifestyle changes, and counseling. Only children with moderate to severe ADHD symptoms should be considered for medication as a first-line treatment option. The good news is that with proper treatment, kids with ADHD can learn to successfully live with and manage their symptoms.[3]

CASE REPORT

This 11 year-old-boy, a student of class five, presented at the age of 8 years on 10.01.2010 at Delta Medical College Paediatric outpatient department with his parents. The parents had noticed that since 5 years of age he seemed constantly restless, irritable, disorganized, and inattentive than his older brother was at the same age. He was aggressive at times and had poor discipline. He would tear through the house, shouting, pulling clothes, ornaments, or spectacles of family

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members or strangers.Parents often had to repeat instruction and he left tasks half finished. He showed no sense of danger, for example, climbing fearlessly and ignoring repeated warnings. He was clumsy most of the time. His problems got highlighted when he started school at 6 years of age. The teacher was concerned about his not listening much of time. He did not sit in classroom, threw items at other students and frequently left his seat during class hour. His schoolwork was inconsistent and hardly satisfactory. He often failed to finish his assignments. He was born at term and his milestones of development were normal except speech. He said meaningful words at 2.5 years and two-word sentence at 3 years of age. He came from an educated family having two older siblings and no such family history. Previously he was treated with antipsychotic and antidepressant drugs by adult neurologist and psychiatrist.

During interview he constantly shifted position, folded arms behind his head, or leaned over the table in front of others. He also got out of his seat frequently, played with buttons on clothes and could not sit still. When he was asked any question, he repeated the same once softly and thereafter answered. He was oriented in time, place, person and intelligence was normal. He showed difficulty in sustaining attention and concentration which was elicited in reading and writing task given to him. Systemic examination including development revealed normal finding. Base line investigations including serum lead level were done with normal findings.

The patient was put on tablet methylphenidate (Ritalin) 5 mg twice a day and parents were asked to follow some behavior modification therapy. For example, creating a routine for daily activities and setting up a system of consistent reward for appropriate behaviour and structured punishment for inappropriate ones. He was kept on regular follow up and side effects of the drug were discussed with the parents. After 6 months, his symptoms started to improve gradually but developed anorexia, mild insomnia and after 1.5 years of treatment, he experienced simple motor tics but had normal attention span, hyperactivity decreased, school performance improved, and his behavior both at home and school was described as excellent. Treatment was discontinued after 2 years. He had become a communicative boy who could express his feelings.

DISCUSSION

ADHD is the most common neurobehavioral disorder of childhood, among the most prevalent chronic health conditions affecting school aged children. The prevalence rate in adolescent samples is 2%–6%.[2,3] ADHD is often under diagnosed in children and adolescents. Inattention, hyperactivity, disruptive behavior, and impulsivity are common in ADHD. The symptoms are especially difficult to define because it is hard to draw a line at where normal levels of inattention, hyperactivity, and impulsivity end and clinically significant levels requiring intervention begin. To be diagnosed with ADHD, symptoms must be observed in two different settings for six months or more and to a degree that is greater than other children of the same age.[3]

The specific causes of ADHD are not known. There are, however, a number of factors that may contribute to, or exacerbate ADHD. They include genetics, diet, and their social and physical environments. ADHD is predominantly a genetic disorder with environmental factors contributing a small role to the etiology of ADHD.[4] Twin studies have shown that ADHD is largely genetic with 76% of the phenotypic variance being explained by inherited genetic factors.[4] Mothersof children with ADHD are more likely to experience birth complications, such as toxemia, premature labour. Maternal smoking and alcohol use during pregnancy and pre or postnatal exposure to lead are commonly linked to ADHD.[4] Abnormal brain structures are linked to an increased ADHD. Some researchers have theorized that ADHD is caused by dopamine imbalance in the brain of those affected.[5] Food colourings and preservatives have inconsistently been associated. Psychosocial family stressors can also contribute to or exacerbate the symptoms of ADHD.[4,5]

The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria state that the behavior must be developmentally inappropriate, must begin before age 7 years, must be present for at least 6 months, must be present in 2 or more settings, and must not be secondary to another disorder. DSM- IV identifies three subtypes of ADHD, such as Inattention type, Hyperactivity–impulsivity type, or a combination of both (Combined type).[5] DSM-IV diagnostic criteria for ADHD is as follows:

1. Inattentive type (six or more of symptoms/signs must persist)[5]
   - inability to pay attention to details or a tendency to make careless errors in schoolwork or other activities
   - difficulty with sustained attention in tasks or play activities
   - apparent listening problems
   - difficulty following instructions
   - problems with organization

- avoidance or dislike of tasks that require mental effort
- tendency to lose things like toys, notebooks, or homework
- distractibility
- forgetfulness in daily activities

2. Hyperactive-impulsive type (six or more of symptoms/signs must persist)[5]
   - fidgeting or squirming
   - difficulty remaining seated
   - excessive running or climbing
   - difficulty playing quietly
   - always seeming to be "on the go"
   - excessive talking
   - blurting out answers before hearing the full question
   - difficulty waiting for a turn or in line
   - problems with interrupting or intruding
3. Combined type, which involves a combination of the other two types and is the most common.

Many children with ADHD also present with co morbid psychiatric conditions, including opposition defiant disorder, conduct disorder, learning disabilities, and anxiety disorders.[6]

There are no laboratory tests available to identify ADHD in children.Gathering as much information as possible about the child is the best way to get an accurate diagnosis and rule out other possible causes of the child's symptoms. The doctor may also check hearing and vision so other medical conditions can be ruled out.[5,6]

ADHD can be successfully managedwith a combination of behaviour therapy and medication.[7] The parent and child should be educated with regard to the ways ADHD can affect learning, behavior, self-esteem, social skill, and family function. Behavioral therapy attempts to change behaviour patterns by the following ways[7]:

- reorganizing a child's home and school environment
- giving clear directions and commands
- setting up a system of consistent rewards for appropriate behaviors and negative consequences for inappropriate ones

The most widely used medications for the treatment of ADHD are the psycho stimulant, including methylphenidate, amphetamine. There are a number of non-stimulant medications, such as, atomoxetine that may be used as alternatives.[8] Methylphenidate is a norepinephrine and dopamine reuptake inhibitor, which means that it increases the level of the dopamine neurotransmitter in the brain.[8] Methylphenidate should be used in children more than 6 years of age and started with a low dose (<20 mg/day). Over the first 4 weeks, the physician should increase the dose as tolerated to achieve maximum benefit.[5,8] Methylphenidate may cause moderate appetite suppression, mild sleep disturbance, transient weight loss, emergence of tics.[9] They may be associated with increased risk of sudden cardiac death, myocardial infarction, and stroke in patients with underlying cardiac disease. Patient should be kept on regular follow up for four or more times yearly.[9]

ADHD medications reduce hyperactivity and impulsivity and improve their ability to focus, work, and learn.[10] Medication also may improve physical coordination. About 60%–80% of children continue to experience symptoms in adolescence and 40%–60% of adolescents exhibit ADHD symptoms into adulthood.[5,10]

In the presented case, patient fulfilled the diagnostic criteria for ADHD and methylphenidate was continued for 2 years along with behavioral management with good outcome.

CONCLUSION

As children diagnosed with ADHD often have significant difficulties in adolescence, regardless of treatment, so early detection, diagnosis and treatment is very important for prevention of long-term adverse effects of ADHD.[10]

REFERENCES

1. Rader R, McCauley L, Callen EC. Current strategies in the diagnosis and treatment of childhood attention-deficit/hyperactivity disorder. Am Fam Physician 2009;79(8):657–65.
2. Van Cleave J, Leslie LK. Approaching ADHD as a chronic condition: implications for long-term adherence. J Psychosoc Nurs Ment Health Serv. 2008;46(8):28–37.
3. Nair J, Ehimare U, Beitman BD, Nair SS, Lavin A. Clinical review: evidence-based diagnosis and treatment of ADHD in children. Mo Med. 2006;103(6):617–21.
4. Linnet KM, Dalsgaard S, Obel C, Wisborg K, Henriksen TB. Maternal lifestyle factors in pregnancy risk of attention-deficit/hyperactivity disorder and associated behaviors: review of the current evidence. Am J Psychiatry 2003;160(6):1028–40.
5. Behrman RE, Kliegman RD, Jenson HB. Nelson Textbook of paediatrics. 19th ed. Philadelphia: WB Saunders; 2011. pp. 108–12.
6. Wilens TE, Biederman J, Spencer TJ. Attention deficit hyperactivity disorder across the lifespan. Ann Rev Med. 2002;53:113–31.
7. Fabiano GA, Pelham WE, Coles EK, Gnagy EM. A meta-analysis of behavioral treatments for attention-deficit hyperactivity disorder. Clin Psychol Rev. 2009;29(2):129–40.
8. Greenhill L, Kollins S, Abikoff H, McCracken J, Riddle M, Swanson J. Efficacy and safety of immediate-release methylphenidate treatment for preschoolers with attention deficit hyperactivity disorder. J Acad Child Adolesc Psychiatry 2006;45(11):1284–93.
9. Swanson J, Greenhill L, Wigal T, Kollins S, Stehli A, Ghouman J, et al. Stimulant-related reductions in growth rates in the PATS. J Acad Child Adolesc Psychiatry 2006; 45(11):1304–13.
10. Wilens TE, Spencer TJ. Understanding attention-deficit/hyperactivity disorder from childhood to adulthood. Postgrad Med. 2010;122(5): 97–109.