

A Review of Diagnostic Criteria and Therapy for Attention Deficit Hyperactivity Disorder

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ADHD SERIES, P1

Introduction

Attention Deficit Hyperactivity Disorder, or ADHD, is the most common mental disorder affecting children. Estimates are that 3 to 5 percent of school age children (about 2 million American children) have the disorder. Boys are more commonly affected than girls by 4:1 to 9:1, though it is thought that many girls with ADHD have gone undiagnosed.

This disorder is by no means a new entity. In 1902, George Still published in *Lancet* descriptions of 20 children with ADHD-like behaviors. He characterized these children as defiant, excessively emotional or “passionate,” impaired in attention, showing little “inhibitory volition,” and overactive, among other descriptors. Various

terms have followed the theories and studies of such behavioral problems over the years, such as “organic drivenness” in 1934, “restless syndrome” in 1938, minimal brain damage or dysfunction (MBD) through the ‘50s, and Hyperkinetic Syndrome (hyperkinesis) in the ‘60s and ‘70s. In 1980, the terms Attention-Deficit Disorder



with Hyperactivity (ADD/+H) and Attention-Deficit Disorder without Hyperactivity (ADD/-H) were applied to the disorder. ADD/-H is also categorized as Undifferentiated ADD and is an area in which further study is needed.

The diagnosis of ADHD must be made with great care, following the specific criteria set forth in the Diagnostic and Statistical Manual of Mental Disorders (DSM). The diagnosis, which applies to both children and adults, involves three essential features: inappropriate inattention, impulsivity, and hyperactivity. All symptoms do not have to be present at the same time or in the same setting, and the severity of the symptoms may vary in different situations. The symptoms typically appear by age 3 and must be present by age 7, although treatment may not be indicated until the child enters school. After onset, the behavioral signs must continue for at least six months and be judged to be more frequent or severe than in others of the same age and similar backgrounds. Furthermore, the behaviors must be persistent and pervasive, occurring in many different settings and causing significant problems in at least two areas of a person's life, such as school, home, work, and social settings.

Hyperactivity, impulsivity, and inattention can also occur in many other disorders besides ADHD, and care must be taken to rule out other possibilities before making the diagnosis of ADHD. Other things to consider include underachievement at school due to a learning disability; inattentiveness due to a middle ear infection or visual problem; attention lapses caused by absence (petit mal) seizures; and disruptive or unresponsive behavior due to chronic fear, anxiety, or depression. Hearing and vision problems are often detected by routine screening tests at schools, while other problems require evaluation by professionals such as psychologists, psychiatrists, and neurologists.

Besides recognizing the need to distinguish ADHD from other problems with similar symptoms, it is also important to know that ADHD is often accompanied by other disorders. This makes diagnosis even more difficult. For example, 10 to 33 percent of children with ADHD also have learning disabilities. ADHD interferes with attention and concentration, while a learning disability primarily affects the child's ability to learn or to process information. A small number of people with ADHD have Tourette's Syndrome, which is characterized by uncontrollable tics, twitches, movements, or utterances. Another condition, oppositional defiant disorder,

der, occurs in almost half of children with ADHD, mostly boys, and may lead to serious trouble at school and even with police. Intervention in some form may help prevent serious problems from developing. Every child with ADHD should also be watched for anxiety and depression, which are very common emotional disorders that accompany ADHD and can be treated.

ADHD DIAGNOSIS

The diagnosis of ADHD involves the careful consideration of a number of individuals. The evaluation process usually begins when a teacher or a family member recognizes problems developing due to inattention in school or with impulsive or hyperactive behavior interfering in the classroom or in social settings. A child may first be evaluated by a school counselor or a school psychologist. Other specialists called upon to diagnose ADHD are child psychologists and child psychiatrists. Pediatricians, family practitioners, and neurologists may also become involved. The process involves a specialist talking with and observing the child in class and in other settings, if possible, and the child's teacher and the parents answering questionnaires about how frequent and severe behaviors seem to be. The child may be given intelligence, attention, and achievement tests. The final determination, then, is made by a team of professionals putting together multiple pieces of information.

Sometimes the evaluation for ADHD does not take place until later on in life. About 50 to 80 percent of children with ADHD will have symptoms continuing into adolescence and adulthood. The diagnosis of ADHD in an adult is based on their behaviors at home and at work and, hence, involves a different set of individuals than the diagnosis in childhood. Adults generally describe their own behaviors, which often reflect frustration, restlessness, impatience, disorganization, inability to complete tasks, and a sense of underachievement. Family members may also contribute to an adult's evaluation.

TREATMENT PLANS FOR ADHD

Once a determination of ADHD has been made, treatment plans are developed, again involving a cooperative effort by professionals. A treatment plan for children and adolescents may include drug therapy, identifying an appropriate classroom setting, counseling for the child, and helping parents manage their child's behaviors. Medication should not be the sole method of helping the child.

Studies indicate that the combination of medicine and behavioral and environmental techniques may be more effective than drugs alone.

Drug treatment is indicated for individuals with moderate to severe symptoms, while milder cases may be managed with environmental adaptations alone. The stimulants dextroamphetamine (Dexedrine® or Dextrostat®), methylphenidate (Ritalin®), and pemoline (Cylert®) are the primary drugs used to treat ADHD, and are effective in 70% - 90% of children who take them. Clonidine (Catapres®), an antihypertensive drug, is also being used with increasing frequency. Tricyclic antidepressants and carbamazepine (Tegretol®) may be helpful for children with ADHD who have some accompanying disorder such as depression or anxiety. Aside from any comorbid conditions, the choice of medication usually depends upon the physician's experience with a particular drug and parental preference.

Use of the front line agents, the stimulants, results in immediate short-term increase in attention, control, concentration, and goal-directed effort, while decreasing motor activity and impulsivity. Cognitive performance, such as reading, memory, and arithmetic performance, may also be improved, although this effect is most likely due to an improvement in attention and concentration and not to a specific effect on cognition. The improvement in cognitive performance by stimulants is not limited to children with ADHD but also is seen in normal children. Indeed, in recent years there has been an increased use of methylphenidate in some inattentive students without ADHD, including some with learning disabilities. **A drug trial of stimulant medication should not be used in making the diagnosis of ADHD because even children without ADHD may show improved attention.**

The three stimulant drugs seem to act as regulators in the frontal-neostriatal

dopamine systems of the brain. Children with ADHD seem to have phasic outbursts of activity and inactivity in these areas. This dysequilibrium results in inattentiveness during dull and repetitive tasks and overarousal at other times. The stimulants have slightly different mechanisms of action, so if one drug does not result in an adequate response, the others should be tried. Adjustments in dosage should be tried before switching to another drug, and at least a week should be allowed to assess a change in medication. Studies indicate that there is no significant difference in efficacy between dextroamphetamine and methylphenidate, while pemoline is slightly less effective.

DRUG THERAPY REGIMENS AND DOSAGES

Methylphenidate and dextroamphetamine are available in short-term capsules that last about 8 hours. Pemoline has a longer duration of action, up to 10 hours, which makes once-a-day dosing possible. The dosing regimen must be individualized for each patient. The initial dose of dextroamphetamine is 2.5 mg and of methylphenidate 5 mg. Increased increments of 2.5 and 5 mg, respectively, should be made until optimal dosing is achieved. The maximum daily doses are 40 mg of dextroamphetamine and 60 mg of methylphenidate. Usually a two- or three-times daily dosing schedule is followed for the short-term tablets of dextroamphetamine and methylphenidate. The starting dose for pemoline is 18.75 mg, which is also the increment at which the drug should be increased. Optimal benefit from pemoline usually is seen as 56.25 to 75 mg/day, and its maximum dose is 125 mg/day. The dose of the stimulants should be increased until the maximum therapeutic effect is attained, while staying at or below the maximum dose and not incurring adverse effects.

About half of ADHD children treated with stimulants will experience anorexia and insomnia, both of which can be minimized with changes in dose scheduling. If insomnia occurs, the afternoon dose should be decreased and/or given earlier. Growth suppression is a side effect that may occur, more commonly with dextroamphetamine than with methylphenidate or pemoline. Baseline height and weight should be obtained at the beginning of treatment and subsequently checked

at least quarterly. For children on pemoline, baseline liver function tests should also be obtained, as it may cause elevation of liver enzymes and possible jaundice in some patients. This reaction is reversible on stopping the drug. Other adverse effects of the stimulants include headache and abdominal pain, which may occur early in treatment in about 10 percent of children. At higher doses, about 10 percent of children may experience lethargy and listlessness. Heart rate and blood pressure are usually elevated with treatment, although not usually posing serious problems. Other problems such as visual or tactile hallucinations, delusions, and tics have been reported to occur rarely.

Physicians and parents may choose to give children who are on stimulant medication a periodic drug holiday with cessation of the medication, for example, on vacations, during summers, and even on weekends. Pemoline, however, should not be stopped on weekends because it has delayed onset, requiring 3 to 4 weeks to maximize therapy. The school year should be the longest course of continuous stimulant use, though some drug-free times are preferable even then. When it is necessary to restart the drug (e.g., at the beginning of the school year), the drug may be tried at a lower dose, while keeping the same dosage schedule.

CONCLUSION

According to DiPiro, there are several problem areas in the clinical management of stimulant medication for ADHD. These include: (1) small doses given and infrequent visits to a physician; (2) little follow-up obtained from teachers about response to drug therapy; (3) few, if any, drug vacations during the school year; (4) parents in charge of dosage; (5) a decline in response viewed as a nonresponse rather than a need for dosage increase; and (6) the child not being monitored after discontinuing the drug.

The proper use of stimulant medication in the treatment of ADHD will help many children focus and be more successful at school, home, and play. Methylphenidate and dextroamphetamine are the first choice drugs, particularly methylphenidate, which showed a 2.5-fold increase in use between 1990 and 1995. This increased use is in part due to prolongation of treatment into adolescence and even adult-

hood. As previously noted, ADHD may be a lifelong disorder in some individuals and thus may require treatment into adult life. It is recommended that in adults, medications be stopped briefly every two years to evaluate whether or not continued therapy is necessary. Other treatment modalities including behavioral and environmental techniques should be continued in the absence of drug therapy for optimal management of the disorder.

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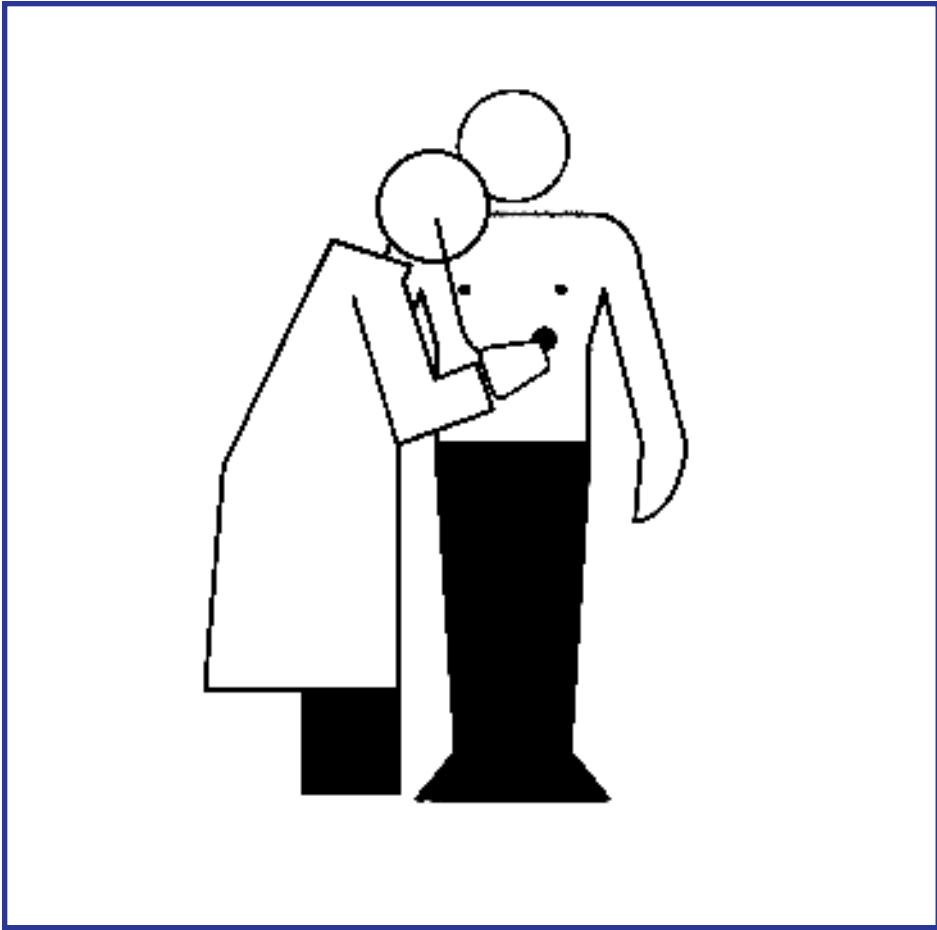
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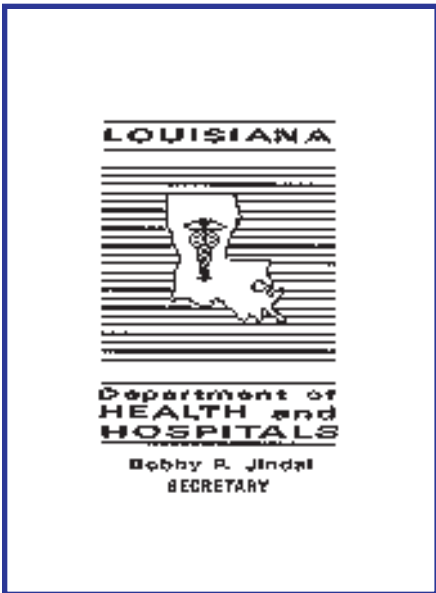
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