Medication for Children With Attentional Disorders

Committee on Children With Disabilities and Committee on Drugs

ABSTRACT. Increasing numbers of children with attentional difficulties have been treated with medication, especially during the last 25 years, and now adolescents and adults are also being recognized with attentional difficulties. This policy statement provides information on the role and the pharmacology of medications used to treat children with attention deficit disorders. Indications and use of medications are discussed and recommended drugs and dose levels are outlined. Information on adverse effects and common side effects is presented.

Children with attentional difficulties have been described since the turn of the century. The modern era of treatment began with the publication by Bradley1 regarding the beneficial effect of benzedrine in children with attentional and other behavior problems. Increasing numbers of children have been treated with medication, especially during the past 25 years, and now adolescents and adults are also being recognized with attentional difficulties. More than 700 studies on the effects of drugs on learning or behavior in children had been published by 1973,2 and many studies and reviews have been published since that time. The American Academy of Pediatrics (AAP) has reviewed this subject several times, beginning with a position paper in 1970; the most recent statement was published in 1987.3 The nomenclature for these disorders has changed with time, as has the knowledge and use of the medications involved. The role and the pharmacology of medications used to treat children with attention deficit disorders is reviewed in light of current information. In recent years, the term attention deficit disorder has become established as a recognized diagnostic category because of its listing in the Diagnostic and Statistical Manual of Mental Disorders compiled by the American Psychiatric Association. The new Diagnostic and Statistical Manual for Primary Care for children and adolescents, developed by the AAP in conjunction with the American Psychiatric Association and the Society for Pediatric Psychology, offers a comprehensive, pediatric-oriented definition of attentional disorders. Children with attention deficit/hyperactivity disorder demonstrate a persistent pattern of inattention or hyperactivity and impulsivity that is more frequent and severe than that observed in other children at a similar level of development.4 Although genetic factors or neurologic insults are sometimes involved, the etiology in many instances is unknown. The primary symptoms of these disorders occur along a continuum of severity and include: (1) difficulties with selective attention, including easy distractibility; (2) difficulty with impulse control; (3) problems with maintaining appropriate task-related activities; (4) disorders of executive function, including planning and organization of cognitive tasks; (5) difficulty recognizing and responding to social cues; (6) difficulty attending to directions; and (7) low frustration tolerance. Commonly associated features include combinations of impairments in learning, memory, sequencing, motor skills, language, modulation of emotional response, compliance with societal demands, sleep patterns, and mood and affect. Although attentional disorders may occur alone, they are more commonly manifested as one of a series of symptoms associated with disorders of higher cortical function, including disturbances in movement, cognition, communication, and social competence.

Many educators and physicians do not realize that a differential diagnosis exists for these behaviors much as for any other complex of symptoms. To establish an accurate diagnosis, information must be obtained concerning factors such as: (1) the child's birth, developmental, family, medical, psychosocial, and scholastic history; (2) sensory screening (ie, vision and hearing); and (3) physical, neurologic, and neuromaturational examinations.

As was originally stated by the Council on Child Health:

The use of drug therapy in the management of the hyperkinetic child does not differ appreciably from drug therapy in other treatable maladies. In both instances, prescription drugs should be prescribed only by appropriately licensed physicians. Although the screening of patients may frequently be done by other disciplines, the ultimate selection of patients to be treated remains the responsibility of the prescribing physician.5

INDICATIONS AND USE OF MEDICATION

Medication may be indicated when a child or adolescent manifests signs of an attentional disorder and other related difficulties to a point that these problems interfere with the ability to learn or to develop satisfactory interpersonal relationships. Such symptoms may result in academic failure, inability to fulfill intellectual potential, poor self-esteem, or socially maladaptive behavior.

Drug therapy should not be considered a panacea or cure-all. An appropriate diagnostic evaluation is
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Changes in attention and behavior should be closely monitored but it may take several weeks before maximum effective rating scale as a baseline for behavioral observations at school and home. The use of a qualitative, small increases. The effects of methylphenidate in significant improvement in 70% to 80% of properly diagnosed children with attention deficit disorders.6'7 This integrated approach should also continue once the drug therapy has been started. Medication should not be used without clear evidence that a child’s attentional difficulties significantly affect school performance, cause difficulties with social adjustment, or are associated with a significant behavioral disorder. Medication should not be continued if clear-cut benefits are not observed.

RECOMMENDED DRUGS AND DOSE LEVELS

The medications used most effectively and frequently in the treatment of attentional disorders are the stimulants methylphenidate hydrochloride, dextroamphetamine sulfate, and pemoline. Therapy with these drugs results in significant improvement in 70% to 80% of properly diagnosed children with attention deficit disorders.5,6,8,9

Any medication that is used to treat an attentional disorder should be started at a low dose, with gradual, small increases. The effects of methylphenidate and dextroamphetamine become evident quickly, but it may take several weeks before maximum effectiveness can be judged. Pemoline has been believed to require 3 to 6 weeks before effectiveness can be judged, but more recent evidence indicates that this drug may show an effect very quickly.10 The usual dose range for methylphenidate is 0.3 to 0.8 mg/kg per dose given two to three times each day; low doses are recommended for initial treatment.11

The usual starting doses of methylphenidate for children in the early elementary grades are 5 mg in the morning and 5 mg at noon, with an additional dose after school if needed. Each dose of the standard form of methylphenidate provides improved attentional ability for 3 to 4 hours. The dose can then be increased gradually, if necessary, to obtain optimal response. Doses of methylphenidate greater than 1.0 mg/kg per dose may lead to decreased performance in attention testing and memory.8 The increased use of methylphenidate in the adolescent and adult population is recent enough that maximum doses have not been established. The manufacturer does not recommend a daily dose larger than 60 mg for children. Changes in attention and behavior should be closely monitored at school and home. The use of a qualitative rating scale as a baseline for behavioral observations is advisable before treatment is started and should be continued regularly thereafter.12,14

Dextroamphetamine and methylphenidate are manufactured as short- and long-acting medications. The recommended dose of dextroamphetamine is half that of methylphenidate. Results with the sustained-release form of methylphenidate have been disappointing, because the duration of effect is highly variable.14,15 Pemoline is generally administered at a dose of 1 to 2 mg/kg once a day in the morning.

OTHER POTENTIALLY USEFUL DRUGS

Tricyclic antidepressants also ameliorate the symptoms of attentional disorders in children.16 The most commonly used drugs are imipramine, desipramine, and nortriptyline. Overall, stimulant medications appear to be superior to the tricyclic drugs in the treatment of attentional disorders.16 Tricyclic drugs, however, represent appropriate drugs of second choice when children do not respond to stimulant drugs, have intolerable side effects of stimulant drugs, or have attentional deficits associated with anxiety, mood disturbances, or depression. Blood levels can be helpful in establishing the proper dose. Many authors recommend various forms of electrocardiographic monitoring during therapy with tricyclic drugs, owing to a very small number of reports of sudden death in children receiving these medications.17 Several studies have demonstrated electrocardiographic changes during therapy with these drugs, especially prolonged QT intervals.18,19 On the other hand, no current evidence indicates that such monitoring can help clinicians identify a child at risk, and the value of such monitoring has not been demonstrated. Thus, routine electrocardiographic monitoring is not recommended at this time.

A variety of other medications have helped selected children. The most commonly used alternative medication to the stimulant drugs and tricyclic antidepressants has been clonidine.20 Although clonidine has not been approved for this purpose, it is particularly useful for treating the hyperactive component of attentional disorders and has been helpful in children with associated conduct disorders. The major side effect is sleepiness. Clonidine can be used alone or in combination with the stimulant medications. A bedtime dose of clonidine may benefit those children who respond well to the stimulant medications but who develop insomnia.

The use of alternative drugs such as tricyclics and clonidine must be approached with caution, because they have the potential for causing death when ingested intentionally by emotionally fragile children or accidentally by their siblings (and other household members). When the decision is made to use potentially toxic medications for a behavior disorder, the caregivers should be informed about the risks. Pediatricians should help assure that families take precautions to avert toxic ingestion of these drugs.

ADVERSE EFFECTS

The most common side effects of stimulant medications are decreased appetite, insomnia, stomach-
aches, and headaches.21 There had been concern that stimulant medications lead to growth retardation. Recent studies indicate, however, that no growth suppression occurred with doses of methylphenidate up to 0.8 mg/kg taken for a prolonged period.22 On rare occasions, pemoline has been linked to a hypersensitivity reaction, which may result in jaundice and elevation in laboratory tests of liver function. Overt hepatic dysfunction is rare.

Stimulant drugs can also help alleviate the attentional deficits that may accompany other developmental problems, such as tic disorders, pervasive developmental disorders, and mental retardation. Occasionally, however, children with these disorders experience worsening of their symptoms. For this reason, such drugs must be used with added caution in children whose attentional difficulties are part of broader developmental problems. There is no conclusive evidence that the stimulant medications precipitate tic disorders, such as Tourette syndrome, except when a genetic predisposition already exists.23

Drug holidays on weekends and during summer vacations have been suggested by some physicians. This suggestion is based on the unproved hypothesis that sensitivity to the effects of stimulant drugs is heightened if they are given intermittently. This recommendation also reflects the concern that continuous administration leads to growth suppression. For many patients the symptoms of attentional disorders may not disappear during vacations or weekends. For these patients, drugs should be given continuously. Medication should be administered continuously when the child’s impulsiveness, activity, and other traits result in significant maladaptive behaviors toward family and peers.

RECOMMENDATIONS

Drug therapy should not be used as a part of the overall treatment program for children and adolescents without clear evidence that their attentional disorders have led to social, behavioral, and learning difficulties, and such therapy should not be continued if clear-cut benefits are not observed. Careful evaluation of patients is essential before drug treatment is initiated. Monitoring and follow-up both at school and home are vital. Pediatricians must work in concert with parents, principals, teachers, special educators, and school nurses to combine drug therapy with appropriate management of the child’s environment and curriculum. In view of requests from other professionals and from school personnel to prescribe medication for children with attentional disorders, pediatricians should be cautious of becoming surrogate prescribers of medication. Although the overall management of social and school failure is a multidisciplinary venture, it is important to remember that the ultimate responsibility for the use of medication is the physician’s.24 The decision to use medication must always consider the overall needs of the child and family, and medication should never be considered the complete treatment program.
REFERENCES

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