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ATTENTION DEFICIT DISORDERS

METHYLPHENIDATE AND FLEXIBLE THINKING IN ADHD

The acute effects of methylphenidate (MPH) in 3 dosages (0.3, 0.6, and 0.9 mg/kg) on the performance of 17 ADHD children in tests of cognitive flexibility were evaluated at the Departments of Psychology and Pediatrics, McGill University-Montreal Children's Hospital Research Institute, Canada. On five tasks designed to assess divergent and convergent thinking, problem solving, speed and accuracy of processing, perseveration, and ability to shift mental set, linear improvement across dosages was the usual pattern and deleterious effects on flexible thinking and other cognitive processes were minimal, either in the total ADHD group or in subgroups. On the Wisconsin Card-Sorting Test, nonperseverative errors decreased significantly with increasing dosage of MPH. Perseverative errors showed a similar pattern. On the Trailmaking Test, subjects completed task (Form A) more quickly on higher dosages of MPH than on placebo. Alternate Uses and Contingency Naming Tests also showed significant dosage effects and linear trends, reflecting more valid responses or fewer errors. (Douglas VI et al. Do high doses of stimulants impair flexible thinking in attention-deficit hyperactivity disorder? *J Am Acad Child Adolesc Psychiatry* July 1995;34:877-885). (Reprints: Dr Virginia I Douglas, Department of Psychology, McGill University, 1205 Docteur Penfield Ave, Montreal, Quebec, Canada H3A 1B1).

COMMENT. Methylphenidate in acute doses caused no perseverative effects but rather, improved persistence in children with ADHD, and scores on tests measuring cognitive flexibility were increased. The authors recommend a dose range of MPH not exceeding 0.3 to 0.6 mg/kg in clinical practice. They find little advantage in higher doses and have concerns about side effects and possible impairment of cognitive functioning with multiple daily doses.

In a total of 40 ADHD children, 18 with comorbid anxiety and 22 without, who were treated with MPH in a placebo-controlled, crossover trial with MPH (0.3, 0.6, 0.9 mg/kg) at the Department of Psychiatry-Research Unit, Hospital for Sick Children, Toronto, the performance on

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a working memory cognitive task was enhanced in the ADHD group but not in children with comorbid anxiety. Both groups showed a lessening of motor activity. (Tannock R et al. Differential effects of methylphenidate on working memory in ADHD children with and without comorbid anxiety. J Am Acad Child Adolesc Psychiatry July 1995;34:886-896).

The importance of rewards such as money and the role of motivation in explaining the effects of stimulant medication in children with ADHD were suggested by a study of 16 ADHD boys receiving MPH or placebo at the Department of Educational Psychology, University of Utah, Salt Lake City. ADHD subjects earned significantly more money on a button pressing test during drug treatment compared to placebo. Drug-related improvements in cognitive tasks may be a consequence of increased effort. (Wilkinson PC, Kircher JC et al. Effects of methylphenidate on reward strength in boys with attention-deficit hyperactivity disorder. J Am Acad Child Adolesc Psychiatry July 1995;34:897-901).

Our British colleagues now recognize the diagnosis of ADHD and have begun to treat with methylphenidate in a limited way. (Taylor E, Hemsley R. Treating hyperkinetic disorders in childhood. Treatment needs care but is worthwhile. BMJ 24 June 1995;310:1617-1618). At a meeting in England in the 1970s, Dr Ronald C Mac Keith of the Spastics Society once scolded me for my interest and research in the hyperkinetic child with MBD. It was his opinion that the entity was over emphasized in America and did not exist in the UK. (Millichap JG, Ed. Learning Disabilities and Related Disorders: Facts and Current Issues. Chicago, Year Book Medical Publishers, 1977).

DEFINITION AND CLASSIFICATION OF ADHD

Issues relating to the definition and classification of ADHD are outlined from the Departments of Pediatrics, Neurology, and Child Study, Yale University School of Medicine, New Haven, CT. In *DSM-III-R* (1987) attention deficit disorder with hyperactivity was referred to as ADHD, and ADD without hyperactivity was called undifferentiated ADD. In *DSM-IV* (1994) the categories of ADHD are 1) inattention only, 2) hyperactive only, or 3) combined inattention-hyperactive type. "Attention," the psychological construct as measured in the laboratory, should not be confused with "behavior attention deficit," the disorder evaluated by rating scales. Despite the *DSM* definitions of types, children with ADHD represent a heterogeneous population that varies with 1) the degree of cognitive and behavioral overlap, 2) the relative predominance of inattention or hyperactive-impulsive behavior, and 3) the specialty interest of the professional who diagnoses and treats the patient - pediatrician, child neurologist, psychiatrist, psychologist, educator, or speech-language pathologist. Samplings from mental health settings have different characteristics compared to those from pediatric neurology clinics. Patients with comorbid behavioral disorders such as oppositional and conduct disorders would be referred to psychiatrists and clinical psychologists, while those with ADHD complicated by learning disabilities are more likely to be seen by the pediatric neurologist and educational psychologist. A systematic classification of subtypes of ADHD should lead to more precise definitions of etiology, treatment, and prognosis. (Shaywitz BA, Fletcher JM, Shaywitz SE. Defining and classifying learning disabilities and attention-deficit/hyperactivity disorder. J Child Neurol 1995;10