Stimulant Medication Effects on Learning in Children with Mental Retardation and ADHD

Benjamin L. Handen,1,4 Sarah McAuliffe,2 and Lourdes Caro-Martinez3

Forty four children (ages 6-13 years) with moderate mental retardation to borderline intellectual functioning participated in a double-blind, placebo-controlled trial of methylphenidate (Ritalin) involving .3 and .6 mg/kg medication doses and a placebo. Sixty six percent of subjects were found to be responders to medication based upon weekday school reports or data obtained while attending a weekly Saturday laboratory classroom. The assessment of medication effects on learning was conducted via a daily work task (number of problems completed and work accuracy) and a short-term auditory memory task. Results indicated beneficial medication effects on work output during the weekday and Saturday program, but gains in work accuracy in the weekday classroom only. No significant medication effects were noted on the short-term auditory memory task. Results are consistent with previous research and suggest that children with mental retardation and ADHD require supplemental programming, such as the teaching of specific learning strategies or behavioral interventions, to take full advantage of gains resulting from medication.

KEY WORDS: Mental retardation; attention deficit hyperactivity disorder; methylphenidate; learning.

INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) has an estimated prevalence rate of 9%-18% in children with mental retardation (Ando and

1Western Psychiatric Institute and Clinic, Pittsburgh, Pennsylvania 15213.
2University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania 15260.
3Department of Psychology, University of Pittsburgh, Pittsburgh, Pennsylvania 15260.
4To whom correspondence should be addressed.
Yoshimura, 1978; Epstein et al., 1986; Jacobson, 1982). This is three to four times the rate reported among typically developing children (Barkley, 1990). Studies indicate that 80% to 90% of children diagnosed with ADHD will be treated with stimulant medication, the most frequently used treatment intervention, at some point prior to adulthood (Bosco and Robin, 1980). These medications include Ritalin (methylphenidate), Dexedrine (d-amphetamine), and Cylert (pemoline) which target the primary symptom cluster of inattention, impulsivity, and overactivity. Secondary symptoms such as social problems and learning difficulties also appear to improve with the use of these medications. For example, a number of studies have found stimulant medication to positively affect social interactions between children with ADHD and peers, leading to a reduction in aggressive behavior and greater peer acceptance (Cunningham et al., 1985; Whalen et al., 1989). Other researchers have documented significant gains in laboratory tests of learning as well as in classroom seatwork completion with the use of stimulant medication. However, studies of academic achievement have shown minimal evidence of positive medication effects (see review by Carlson and Bunner, 1993).

During the past decade, there have been a number of studies published examining the efficacy of stimulant medication in children with mental retardation and ADHD (e.g., Aman et al., 1993; Aman et al., 1991; Handen et al., 1990; Handen et al., 1992). As with research on typically developing children with ADHD, this work has documented significant drug effects on classroom and laboratory measures of attention span, impulsivity, and activity level. There has been an implicit assumption that with improved attentional skills, children with mental retardation and ADHD will also evidence gains in learning. However, unlike the available research among typically developing children with ADHD, there is limited data to support such a notion among children with mental retardation.

We are aware of only a single study (Blacklidge and Ekblad, 1971) within the past 25 years which has examined the effect of stimulant medication on academic achievement in children with mental retardation. This study did not specifically target children with ADHD, but included 29 students from three classrooms serving children with mental retardation. Scores on achievement tests of reading and arithmetic failed to show significant improvement following two months of treatment with methylphenidate. A few studies have examined the effect of stimulant medication on work output and accuracy, although with somewhat small study samples of children with mental retardation and ADHD. For example, Handen et al. (1990) and Handen et al. (1992) found significant increases on measures of classroom on-task behavior in a two double-blind studies of methylphenidate and placebo. However, while gains in work output and accuracy were