Clinical correlates of working memory deficits in youth with and without ADHD: A controlled study.

Fried R, Chan J, Feinberg L, Pope A, Woodworth KY, Faraone SV, Biederman J.


Abstract

OBJECTIVE:
Both working memory (WM; a brain system that provides temporary storage and manipulation of the information) and attention-deficit/hyperactivity disorder (ADHD) have been associated with educational deficits. Since WM deficits are prevalent in children with ADHD, the main aim of the present study was to examine whether educational deficits are driven by working memory deficits or driven by the effect of ADHD itself.

METHOD:
Participants were referred youth with (N = 276) and without (N = 241) ADHD ascertained from pediatric and psychiatric sources. Assessment included measures of psychiatric, psychosocial, educational, and cognitive functioning. Education deficits were defined as grade retention or placement in special classes and were assessed using interviews and written rating scales. Working memory was assessed using the Wechsler Intelligence Scale for Children-Revised (WISC-R) Freedom from Distractibility (FFD) factor based on Digit Span, Arithmetic, and Coding.

RESULTS:
Significantly more youth with ADHD had WM deficits than controls (31.9% vs. 13.7%, p < .05). In ADHD children, WM deficits were significantly (p < .01) associated with an increased risk for grade retention and placement in special classes as well as lower scores on reading and math achievement tests than for ADHD children without WM deficits. In contrast, no other differences were noted in other areas of functioning. Although WM deficits also had some adverse impact on educational and cognitive correlates in non-ADHD controls, these differences failed to attain statistical significance.

CONCLUSION:
WM deficits significantly and selectively increase the risk for academic deficits and cognitive dysfunction in children with ADHD beyond those conferred by ADHD. Screening for WM deficits may help identify children with ADHD at high risk for academic and cognitive dysfunction.