Memory Training Lifts Some ADHD Symptoms

BY BRUCE JANCIN
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VIENNA — A computerized method of systematically training working memory provides a nonpharmacolog- ical means of reducing inattentive sympto- mptoms in children who have attention- deficit/hyperactivity disorder, Dr. Torkel Klingberg said at the annual congress of the European College of Neuropsychopharmacology. In his randomized, double-blind, mul- ticenter, controlled trial, parents of children who received this proprietary method of working memory training reported their children’s ADHD symptoms as improved by 1 full standard de- viation more than did parents of children in the control arm. The improvement was seen largely in inatten- tive symptoms, where the treat- ment effect size was greater than typi- cally reported with stimulant medica- tion. Working memory training had far less impact on hyperactivity symptoms, according to Dr. Klingberg, a professor of cognitive neuroscience at the Karolinska Institute, Stockholm. The improvements in both working memory and ADHD symptoms were sustained long term in this study of 53 children aged 7-12 years who were not on stimulant medication. Eighty-five percent of the improvement in visuo- spatial working memory documented on the span-task board at the conclusion of 5 weeks of training was retained at retesting 5 months later. A 2-week train- ing refresher boosted the improvement back up to 100%. Forty-two percent of blinded par- ents indicated in interviews that the re- duction in their children’s ADHD symptoms noted at the end of training was maintained over the next 5 months, and an additional 40% noticed further symptomatic improvement during that period. The most likely ex- planation for this surprising late addi- tional symptomatic improvement is that the gains in working memory en- abled children to more effectively tackle homework and other complex tasks, Dr. Klingberg said. The children also showed significant improvements in laboratory tasks meas- uring complex reasoning, response in- hibition, and verbal working memory. This indicates that the effects of working memory training had spread to nontrained executive function tasks, he said. Working memory is the ability to re- tain information during a delay, typi- cally less than 1 second, then retrieve it to perform such everyday tasks as solving problems, remembering instructions, reading with comprehension, and con- trolling attention. Working memory is part of executive function, and working memory deficits are common in ADHD. Dr. Klingberg is credited as a pioneer in demonstrating that working memo- ry training can be effective because it is believed that this yields gains in other executive functions and a reduction in ADHD symptoms. The computer-based working memo- ry training program used in his stud- ies was developed by Cogmed, a Stock- holm-based company. Dr. Klingberg is the company’s founder and senior sci- entific adviser. Participants in his multi- center, double-blind trial trained for 40 minutes per day, 5 days per week, for 7 weeks. The program in- cludes an algo- rithm for in- creasing the difficulty of the working memo- ry tasks. Chil- dren do the exer- cises on the Internet, and that enables their activity to be monitored. The neuroanatomic rationale for working memory training in ADHD is provided by a magnetic resonance brain imaging study Dr. Klingberg and his colleagues conducted in healthy young adults. Working memory training re- sulted in increased brain activity in the dorsolateral prefrontal cortex and the parietal association cortex while subjects performed a working memory task. These areas of the brain have been im- plicated in ADHD, he noted. The use of stimulant medication does not interfere with working memory training. In fact, a slightly greater im- provement in working memory was documented in 70 ADHD patients on medication than in 66 not on medica- tion in a study now in press, Dr. Kling- berg said. The efficacy of the Cognomed program was recently confirmed in an indepen- dent validation study conducted by Bradley S. Gibson, Ph.D., director of the perception and attention laboratory at the University of Notre Dame (Ind.). In addition, clinical trials are under- way evaluating working memory training in patients with stroke or traumatic brain injury. Dr. Joseph Biederman, session cochair, and professor of psychiatry at Harvard Medical School, Boston, noted that not all children with ADHD have working memory deficits, and he asked what point there was in providing work- ing memory training to those without such deficits. “To be honest, we don’t know all of the effects here,” Dr. Klingberg replied. “But we know that [methylphenidate] does not interfere with training pro- jects, irrespective of whether they have ADHD, perhaps by improving supportive executive functioning.”

ADHD Goes Underdiagnosed in Chinese Immigrant Families

BY SHERRY BOSCHERT
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SAN FRANCISCO — A very low preva- lence of childhood attention-deficit/hy- peractivity disorder in New York’s Chines- e community suggests a lack of awareness of undiagnosed cases of the disorder, Dr. Lore- tta Au said at a poster presentation at the an- nual meeting of the American Academy of Pediatrics.

Surveys of 225 Chinese immigrant par- ents, 178 school faculty (mostly teachers), and 20 community-based pediatricians found that parents lacked knowledge about ADHD, and school staff and physicians re- ported a wide variety of obstacles to diag- nosis and management of ADHD in the Chinatown population, reported Dr. Au of the Charles B. Wang Community Health Center, New York, and her associates.

The investigators designed the study af- ter noticing that the 0.1%-0.2% prevalence rate for childhood ADHD at the center was far below reported prevalence rates of 4%- 12% for broader populations. Faculty at five Chinatown elementary schools reported that 6% of 3,039 children in the schools ex- hibited signs of ADHD—a rate consistent with the wider prevalence rates for ADHD—but only 1% of students had of- ficial diagnoses for the disorder, the school survey noted.

Among 20 pediatricians who returned anonymous, mailed surveys, 70% said they are aware of criteria and guidelines for diagnosing ADHD, and 95% said they would like more help in diagnosing the disorder. A majority of the pediatricians (65%) referred patients with suspected ADHD to neurologists or mental health providers for official diagnosis. Not han- dling ADHD in the patients’ medical home may contribute to underdiagnosis, Dr. Au suggested.

Surveys that were translated into Chi- nese were answered by parents at schools and the Community Health Center. Only 15% knew of the symptoms of ADHD, and 53% knew about the consequences of un- treated ADHD, although 58% of parents had heard of the disorder. Seventy-seven percent were interested in learning more, and 83% said their community needs more information on ADHD.

Common obstacles to diagnosis and management of ADHD reported by physi- cians included a lack of coordinated care (21%), parental mistrust or denial of the di- agnosis (20%), and lack of bilingual men- tal health services (20%). School faculty also pointed to a lack of coordinated care (18%), a lack of resources (17%), and fami- lies who don’t follow through on recom- mendations for evaluation or treatment of ADHD (23%).

“Especially for Chinese patients, and I think in general for Asian patients, ADHD is something that they might have heard about, but they might not think about as a medical problem,” Dr. Au said. They might not present the problem to their doc- tor unless asked [about it]. They might be ashamed about the fact that their child is not doing well in school. A lot of times they are concerned about hyperactivity symptoms, but they might blame them- selves for poor parenting.”

Busy pediatricians might not pursue the topic if parents don’t ask about it, she added. In Chinese immigrant populations, “the pediatrician needs to be asking about school performance, and telling parents about ADHD, and that it might impact upon school performance and the future of the child.”

The results of the study prompted her center to take several steps to increase edu- cation and coordination of care around ADHD. The center staff created bilingual educational materials for parents and trans- lated ADHD assessment scales into Chi- nese. An ADHD multidisciplinary team meets monthly on care management. A pediatrician and social worker from the center give bilingual workshops in the community and schools about ADHD. Clinicians meet quarterly with school counselors, who now fax referrals to the center for children with ADHD symptoms.

The center also started a support group for parents of children with ADHD.

Study Links Food Additives to Hyperactive Behavior in Children

Children given a beverage containing certain mixtures of food colors and the preservative sodium benzoate showed sig- nificantly increased hyperactivity scores in a British randomized, controlled, cross- over study.

Findings of the study, which included 153 3-year-olds and 144 8- and 9-year-old chil- dren selected from the general population, support previous research suggesting that certain food additives can exacerbate hy- peractive behaviors such as inattention, impulsivity, and overactivity.

Investigators at the current study said their findings suggest that the policy mak- ers review the use of food additives because of their potential negative effect on edu- cation (Lancet 2007 Sept. 6 [Epub doi:10.1016/S0140-6736(07)61306-3]).

“This study provides evidence of dele- tious effects of (additives) on children’s be- haviour with data from a whole population sample,” wrote the researchers, led by Jim Stevenson, Ph.D., of the University of Southampton’s School of Psychology.

“These findings show that adverse effects are not just seen in children with extreme hyperactivity (i.e., ADHD), but can also be seen in the general population and across the range of severities of hyperactivity.”

The study was funded by a grant from the United Kingdom’s Food Standards Agency.

—Jonathan Gardner