ZINC SUPPLEMENT REDUCES SYMPTOMS OF ADHD

Two decades of research indicate that low zinc levels play a role in hyperactivity-a finding supported by a new study revealing that zinc can be a beneficial treatment for many children with attention deficit hyperactivity disorder (ADHD).

Mustafa Bilici et al. randomly assigned 400 children with ADHD (328 boys and 72 girls) to take either a placebo or 150 mg per day of zinc sulfate for 12 weeks. The researchers evaluated the subjects using a clinical ADHD scale, an adaptation of the Conners Teacher Questionnaire, and a parent rating scale.

Bilici et al. report that subjects taking zinc "showed significant improvement in hyperactivity, impulsivity and socialization scores," although the treatment had no effect on attention deficits. Older children with higher body mass indexes, low zinc levels, and low levels of free fatty acids responded best to the intervention.

The researchers note that zinc is integral to the production of serotonin, and that low serotonin is linked to a wide range of behavior problems, including impulsivity. In addition, Bilici et al. note, zinc is needed for the production and modulation of melatonin, which helps regulate dopamine function, and ADHD is strongly linked to abnormal dopamine levels.

Zinc also is involved in the metabolism of essential fatty acids, which in turn help regulate dopamine and norepinephrine metabolism. Studies implicate low levels of essential fatty acids in ADHD (see related article, *Crime Times*, 2004, Vol. *10*, No. 2, Page 3), and Bilici et al. note that in their study, zinc treatment resulted in a rise in both zinc and free fatty acids.

In light of their findings, the researchers say, "it can be suggested that there is a synergism of zinc and essential fatty acids in regulating dopamine, norepinephrine, and possibly serotonin activity, with implications for treatment of ADHD." Because zinc alone did not completely ameliorate all symptoms of ADHD, the researchers say, it may be most effective as an adjunct to other treatments.

Researcher Bernard Rimland, commenting on the study, says, "The improvement seen in these children in just 12 weeks is particularly remarkable given that hyperactive children who are deficient in zinc are likely to be deficient in other nutrients, such as magnesium, as well. Giving these children adequate supplements of all essential nutrients is likely to be vastly more beneficial than merely giving one nutrient, and should be tried in place of drug treatment."

Support for this approach comes from a study, conducted last year, in which K. L. Harding and colleagues placed 10 children with ADHD on Ritalin, and compared them to 10 ADHD children given dietary supplements consisting of vitamins, minerals, essential fatty acids, amino acids, and other nutrients. The researchers found that "the effect of Ritalin versus dietary supplement treatment was found to be essentially the same, and both treatments were found to be effective after four weeks of use."

"Double-blind, placebo-controlled study of zinc sulfate in the treatment of attention deficit hyperactivity disorder," M. Bilici, F. Yildirim, S. Kandil, M. Bekaroglu, S. Yildirmis, O. Deger, M. Ulge, A. Yildiran, and H. Aksu, *Progress in Neuro-Psychopharmacology and Biological Psychiatry, Vol. 28, No. 1,* January 2004, 181-90. Address: Mustafa Bilici, Department of Psychiatry, Medical Faculty, Karadeniz Technical University, School of Medicine, Trabzon, Turkey, bilici@msn.com.

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"Outcome-based comparison of Ritalin versus food-supplement treated children with ADHD," K. L. Harding, R. D. Judah, and C. Gant, *Alternative Medicine Review, Vol. 8, No. 3,* August 2003, 319- 30. Address: Charles Gant, National Integrated Health Associates, 5225 Wisconsin Avenue, Suite 401, Washington, DC 20015, drgantspractice@aol.com.

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