Omega-3 fatty acids safely reduce autistic symptoms

Fatty acid supplements can markedly improve the behavior of autistic children, according to a recent study.

G. Paul Amminger and colleagues treated 13 autistic children with the omega-3 fatty acids eicosapentaenoic acid (EPA) and docosahexaneoic acid (DHA) for six weeks, in a double-blind, placebo-controlled trial. The children, who ranged in age from 5 to 17, exhibited severe tantrums, aggression, and/or self-injurious behavior. Dosages were 0.84 grams per day of EPA and 0.7 grams per day of DHA.

The researchers compared scores on the Aberrant Behavior Checklist before and after treatment, and report, "Overall, the magnitude of effect sizes of symptom changes between treatment groups ranged from medium for inappropriate speech to large for stereotype and hyperactivity."

They conclude, "The present findings suggest that omega-3 fatty acids may... be an effective and well-tolerated treatment, in particular of hyperactive behaviors including disobedience, distractibility, and impulsivity, in children with autism." They note, too, that omega-3 fatty acids have few side effects (which include stomach upsets and diarrhea), and that these are usually temporary.

—

"Omega-3 fatty acids supplementation in children with autism: a double-blind randomized, placebo-controlled pilot study," G. P. Amminger, G. E. Berger, M. R. Schäfer, C. Klier, M. H. Friedrich, and M. Feucht, *Biological Psychiatry,* August 18, 2006 (epub ahead of print publication). Address: G. Paul Amminger, Department of Child and Adolescent Psychiatry, Medical University of Vienna, Waehringer Guertel 18-20, A-1090 Vienna, Austria, paul.amminger@meduniwien.ac.at.

Low iodine, lithium levels may play a role in autism

Low levels of iodine in the hair of children with autism, and low hair levels of lithium in both the children and their mothers, may offer clues to the genesis of the disorder, according to a recent study.

James Adams and colleagues performed hair analyses on 51 autistic children, 29 mothers of autistic children, and a control group of 40 non-disabled children and their mothers. The researchers report that:

• The autistic group had iodine levels 45% lower than for controls. Iodine deficiency can lead to both thyroid problems and mental retardation, and the researchers say their findings are consistent with studies hinting at altered thyroid function both in autistic children and their parents. Adams and colleagues note that average iodine levels in the U.S. have dropped markedly in past decades due to the decreased use of table salt. "It is possible," they say, "that the decreasing level of iodine in the United States is causally related to the large increase in autism during the last 20 years."

• Autistic children between the ages of three and six exhibited marginally significant reductions in levels of lithium, and mothers of three- to eight-year-old autistic children had significantly reduced lithium levels. Older autistic children also had low levels, but not to a significant degree. Adams and colleagues note that a deficiency of lithium during pregnancy "could adversely affect fetal development and especially brain development." They point out that low levels of lithium are linked to aggression and decreased sociability, and that in animals, a lithium-deficient diet can cause immune problems. The finding that mothers have low lithium levels, the researchers say, could explain autistic children's high rate of ear infections early in life.

"In turn, a higher level of ear infections results in higher oral antibiotic use, which results in a temporary decrease in the ability to excrete mercury and can also contribute to gastrointestinal problems by eliminating normal gastrointestinal flora," they say. "So, a low lithium level is plausible as an important factor in the etiology of autism."

Mothers of autistic children exhibited non-significant elevations of mercury, but the researchers did not detect abnormal levels of any toxic metals in the autistic children themselves. "However, it should be pointed out that this is long past [the children's] primary exposure to mercury (from thimerosal-containing vaccines, maternal seafood consumption, and maternal mercury dental fillings), so this hair measurement would not reflect such a long previous exposure," they say. Thus, they note, their findings are not incompatible with an earlier study showing low levels of mercury in autistic children's baby hair—a finding interpreted to mean that these children had difficult excreting mercury.

"Actually, if both sets of data are valid," Adams and colleagues say, "they suggest a temporary loss of the ability to excrete mercury in young infants," possibly resulting from the effects of oral antibiotics—which can drastically inhibit mercury excretion, according to animal studies.

The researchers also found that autistic children with pica had low levels of chromium. "However," the researchers say, it is unclear if [this] is a cause of pica or the result of it." In addition, they report that a subgroup of autistic children with low muscle tone had markedly low levels of potassium, a nutrient needed for muscle contractions.

—

"Analyses of toxic metals and essential minerals in the hair of Arizona children with autism and associated conditions, and their mothers," J. B. Adams, C. E. Holloway, F. George, and D. Quig, *Biological Trace Element Research*, Vol. 110, 2006, 193-209. Address: James B. Adams, Arizona State University, Tempe, AZ 85287-6006.

Thimerosal and immune function: new clues

New research by Anshu Agrawal and colleagues adds support to studies indicating that the mercury-laden vaccine preservative thimerosal, once used extensively in childhood vaccines and still a constituent of flu vaccines, can skew the immune system toward TH2 responses (which promote allergic reactions) and away from TH1 (viral- and fungal-attacking) responses.

Agrawal and colleagues report evidence that thimerosal modulates the functions of dendritic cells, resulting in promotion of TH2 responses. Exposing human-derived dendritic cells to thimerosal, the researchers say, inhibited the secretion of LPS-induced proinflammatory cytokines TNF-a, IL-6, and IL-12p70 (but not the TH2-like cytokine IL-10) from the cells. "These thimerosal-exposed dendritic cells induced increased TH2 (IL-5 and IL-13) and decreased TH1 (IFN-y) cytokine secretion from the T cells in the absence of additional thimerosal added to the coculture," they say. Thimerosal exposure of dendritic cells depleted levels of intracellular glutathione, and adding glutathione to cell cultures eliminated the TH2-promoting activity of the thimerosal-exposed cells. Previous research has strongly linked reduced levels of glutathione to autism.

The researchers say, "These data suggest that modulation of TH2 responses by mercury and thimerosal, in particular, is through depletion of glutathione in dendritic cells." They note that their study used concentrations of thimerosal "readily achievable during childhood vaccinations."

Agrawal and colleagues say that because mercury-related immune abnormalities are associated with glutathione depletion, the use of dietary supplements that increase intracellular glutathione, such as N-acetyl-L-cysteine, may be an effective intervention in children exposed to thimerosal.

—

"Thimerosal induces TH2 responses via influencing cytokine secretion by human dendritic cells," Anshu Agrawal, Poonam Kaushal, Sudhanshu Agrawal, Sastry Gollapudi, and Sudhir Gupta, *Journal of Leukocyte Biology*, Vol. 81, February 2007, epub ahead of print version. Address: Anshu Agrawal, Division of Basic and Clinical Immunology, Med. Sci. 1 C-240, University of California, Irvine, CA 92697, aagrawal@uci.edu.

MOVING?

—

Please send us your new address several weeks in advance, so you won't miss an issue!