Pilot study: supplement reduces gastrointestinal, sleep problems in autism

Supplementing the diets of autistic children with moderate doses of vitamins and minerals improves their sleep and reduces gastrointestinal problems, according to a recent pilot study.

In a randomized, double-blind study, James Adams and Charles Holloway administered a vitamin/mineral supplement (Spectrum Support) or a placebo to 20 autistic children for three months. Participants ranged in age from three to eight.

A parent questionnaire administered following the intervention showed significant improvements in sleep and GI symptoms in the group taking the multivitamin/mineral supplement as compared to controls. No side effects were reported, with the exception of stomach upset in a pair of twins (a side effect that disappeared when they took the supplement with meals).

Adams and Holloway also report that:

—Vitamin C levels were still slightly low in supplemented children following the intervention, and were significantly lower in the placebo group. "Although the children with autism were not clinically deficient," the researchers say, "they generally had low levels of vitamin C, and high-dose supplementation appeared to only partially help."

—Vitamin B6 levels were higher than average in the study sample. This finding, combined with earlier research showing that autistic children have low levels of pyridoxal-5 phosphate (PLP), an active form of B6—as well as evidence of low activity of pyridoxal kinase, which converts inactive forms of B6 into the active forms PLP and PMP—suggests that autistic children are impaired in their ability to convert B6 to biological useful forms. The researchers say, "This may explain the functional need for high-dose vitamin B6 supplementation in many children and adults with autism."

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"Pilot study of a moderate dose multivitamin/mineral supplement for children with autistic spectrum disorder," James B. Adams and Charles Holloway, *Journal of Alternative and Complementary Medicine*, Vol. 10, No. 6, 2004, 1033-39. Address: James B. Adams, Arizona State University, P.O. Box 876006, Tempe, AZ 85287-6006, jim.adams@asu.edu.

Risperdal rejected

The FDA has rejected an application by Johnson & Johnson to market the drug Risperdal (risperidone) as a treatment for autism. While no reason was provided publicly, the drug—a popular treatment for autism—is linked to severe weight gain, blood glucose irregularities, and other serious side effects (see p. 6).

Testosterone: a key to understanding mercury-autism link?

The hormone testosterone may be a key player in mercury-induced autism, according to a theory advanced by Mark and David Geier. If correct, they say, their theory could help to explain the effectiveness of several current autism treatments, and possibly lead to new ones.

The researchers note, "[I]t has previously been shown that testosterone significantly potentiates mercury toxicity, whereas estrogen is protective." Moreover, they note, studies show that the severity of autism correlates with levels of testosterone in prenatal amniotic fluid. (Prenatal testosterone levels were estimated based on the ratio in length of the second and fourth fingers, a physical marker for exposure to testosterone in the womb.) They also note that a significant percentage of autistic children have elevated plasma testosterone levels, and that the male-to-female ratio in autism suggests a role for sex hormones. "In fact," they say, "closer observation indicates that the more severely affected the group of autistics studied the higher the male-to-female ratio. In very severe autistics males may outnumber females by 15 to 1 or even more."

In addition, the Geiers note that several seemingly unrelated treatments that benefit autistic children have one aspect in common: in one way or another, they lower testosterone levels. These treatments include chelation, secretin, glutathione, cysteine, and growth hormone therapy. There is also a single case report of leuprolide, an injectible antiandrogen, causing dramatic and lasting benefits in an autistic child.

The Geiers say in addition to investigating testosterone-lowering therapies, researchers should evaluate treatments that alter the breakdown of testosterone and estrogen into other chemicals. They note that finasteride, a treatment for baldness and prostate problems, blocks the breakdown of testosterone into 5-alpha-dihydrotestosterone (DTH) and could be effective in the treatment of neurodevelopmental disorders if testosterone metabolic byproducts are demonstrated to exacerbate the toxicity of mercury. They note that research also suggests that finasteride may re-stimulate production of insulin-like growth factor-1 (IGF-1), which can be down-regulated by exposure to the mercury-containing vaccine preservative thimerosal.

In addition, the Geiers say, biochemical manipulations that promote the conversion of testosterone to estrogen may help protect neurons against mercury damage. They add that "FDA approved anti-androgens such as Bicalutamide, Nolvadex, Nilandron, and Flutamide might also protect neurons from damage by mercurials." Such treatments, they say, may work synergistically with existing therapies aimed at reducing mercury levels in autistic individuals.

The researchers say that in addition to helping individuals on the autism spectrum, treatments that address the role of testosterone in mercury toxicity could benefit patients with other disorders in which mercury appears to play a role. These, they say, include Alzheimer's disease, heart disease, obesity, amyotrophic lateral sclerosis (ALS), asthma, and a variety of autoimmune disorders.

Editor's note: There are several more pieces of data that may fit in with the Geiers' theory. One is the consistent finding that parents of autistic children tend to be high achievers—which would be consistent with studies showing that high testosterone levels (which are genetically influenced) often correlate with high achievement and dominance. Another is that in the "old days," before children were exposed to massive levels of mercury through vaccinations, autistic girls tended to be more severely affected than boys—a pattern which appears to be changing. This would be consistent with an increase in autism involving a mercury/testosterone interaction, which would harm boys more than girls.

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"The potential importance of steroids in the treatment of autistic spectrum disorders and other disorders involving mercury toxicity," Mark R. Geier and David A. Geier, *Medical Hypotheses*, Vol. 64, No. 5, 2005, 946-54. Address: Mark R. Geier, Genetic Centers of America, 14 Redgate Court, Silver Spring, MD 20905.

— QUOTE —

Over the years, I've learned several things:

• There seems to be a real and as yet unexplained increase in children being diagnosed with autism.

• Families of these children are remarkable advocates, despite marked decreases in their quality of life.

• Autism is a complex disorder linked to genetics, but it appears to be triggered by heterogeneous environmental factors. One of these triggering factors may be due to immune dysfunction and an abnormal inflammatory response.

James Oleske, M.D., M.Ph., Director, Division of Pulmonary, Allergy, Immunology and Infectious Diseases, University of Medicine and Dentistry of New Jersey (UMDNJ), in "Another view of autism," UMDNJ Research, Winter 2004