

Biomedical Update:

Dietary enzyme therapy: benefits are substantial

Dietary enzyme therapy can significantly reduce the symptoms of autism, according to a new study conducted in collaboration with the Autism Research Institute.

Mark Brudnak, Bernard Rimland, and colleagues tested the effects of a 12-week course of dietary enzyme therapy, using the formulation ENZYMAID, on 46 autistic children and adults. Forty percent of the participants had already been placed on diets eliminating gluten and casein from their diets. The twenty-two subjects who completed the trial were evaluated on 13 parameters, using the Symptom Outcome Survey (SOS). (Those who discontinued the therapy did so for a variety of reasons, most commonly the need to start other therapies. Six of these subjects experienced minor side effects.)

The subjects completing the study, who ranged in age from 5 to 31, exhibited "an overwhelmingly positive trend" on each of the SOS parameters measured, Brudnak et al. say. "The two greatest improvements were seen in socialization and hyperactivity with 90 percent and 80 percent improvements, respectively," they note. "The lowest improvements were for stammering, speech, and sound sensitivity, each scoring 50 percent."

The formula used in the study includes enzymes and galactose and is designed to increase the breakdown of proteins early in the digestive process, improve the environment for beneficial microflora in the gut, enhance the bioavailability of beneficial minerals, and increase the expression of the Dipeptidyl peptidase IV (DPP IV) gene. The DPPIV protein plays a crucial role in the breakdown of peptides as well as in immune system function.

Enzyme therapy is frequently used as an adjunct to a gluten- and/or casein-free diet. The goal of diet and enzyme therapy is to eliminate or successfully break down neuroactive peptides, derived from wheat and dairy foods, that otherwise can escape the digestive tract and adversely affect brain function. (See related story on page 6.)

"Enzyme-based therapy for autism spectrum disorders—is it worth another look?" Mark A. Brudnak, Bernard Rimland, Roy E. Kerry, Margaret Dailey, Robert Taylor, Bruce Stayton, Frank Waickman, Michael Waickman, Jon Pangborn, and Ilene

Reminder: A gift subscription to the Autism Research Review International is a thoughtful gift for a parent, teacher or medical professional interested in autism!

Buchholz, *Medical Hypotheses*, Vol. 58, No. 5, May 2002, 422-8. Address: Mark A. Brudnak, MAK Wood, Inc., 1235 Dakota Drive, Unites E-F, Grafton, WI 53024-9429, makwood@earthlink.net.

Insights into gender and autism susceptibility

Autism affects four times as many boys as girls, and two reports shed light on males' increased susceptibility to the disorder.

John Constantino screened 1,584 non-disabled twins to determine the prevalence of "subthreshold" autistic symptoms, using the Social Reciprocity Scale (SRS), which tests for social deficits, deficits in the social use of language, restricted range of interests, and stereotypic behaviors.

Constantino reports, "In this epidemiologic sample of twins, males exhibited higher levels of severity of social deficits than females," with 1.4 percent of males scoring at or above the mean score for Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS, an inclusive diagnosis for many autistic-like children), as compared to only 0.3 percent of females. SRS reciprocal social behavior scores were more strongly influenced by genetic factors for male twin pairs than for female twin pairs. However, there was no evidence for gender-specific genetic influences. Constantino concludes that "the genes influencing autistic traits appear to be the same for males and females," but that females may be less susceptible to the disorder because of enhanced responsiveness to environmental influences.

In separate research, Simon Baron-Cohen and colleagues measured testosterone in samples of amniotic fluid taken during prenatal testing of infants, and then administered psychological tests to the infants after birth. The researchers found that the children with the highest testosterone levels in the womb tended to have poor eye contact and smaller vocabularies. They also found that social skills decreased on a steady gradient as prenatal testosterone exposure increased. The researchers now plan to study more than 3,000 children in an effort to elucidate testosterone's influences on social behavior and autism.

"Genetic structure of gender differences in susceptibility to autistic traits," John N. Constantino, meeting abstract submitted to the 2002 Annual Meeting of the American Academy of Child and Adolescent Psychiatry. Address: John Constantino, Department of Psychiatry, Washington University School of Medicine, 4940 Children's Place, St. Louis, MO 63110.

"Testosterone levels may cause autism," Robin McKie and Karen Gold, *The Guardian* (UK), May 19, 2002.

Fatty acids ease IBD, other autism symptoms

A high percentage of autistic children suffer from bowel problems, including the unique form of inflammatory bowel disease tentatively linked to the MMR vaccine by physician Andrew Wakefield (see page 1). A new study by researchers in Spain suggests that children with these bowel problems may benefit from treatment with omega-3 fatty acids.

Natalia Nieto et al. induced ulcerative colitis in rats by administering a toxic substance, and then divided the rats into three groups. One group received a diet of fish oil (high in omega-3 fatty acids) plus vegetable oils, while the other groups ate differing combinations of oils that contained a lower ratio of omega-3 to omega-6 fatty acids.

The researchers found that rats eating the diet high in omega-3 fatty acids suffered less colon damage than the other rats, based on a visual and microscopic inspection of the rats' colons and on tests for biochemical markers associated with colon injury. While they caution that their findings may not be applicable to humans, or to other forms of colon disease, the researchers say their data indicate that "dietary fat manipulation... can be a supportive or additional treatment option for inflammatory bowel disease patients."

Omega-3 fatty acids are found in fatty fish, canola oil, nuts, and flaxseed, and are available as supplements. Previous research by Scottish biochemist Gordon Bell indicates that two-thirds of autistic children show signs of omega-3 deficiency, and that supplementing these children's diets with fish oil can improve behavior, sleep patterns, and concentration. In particular, Bell recommends omega-3 supplementation for autistic children with deficiency symptoms including "goose bumps" on the upper arms and legs, rough dry skin, dull hair, dandruff, or soft and brittle nails.

Other studies (see ARRI 16/1) indicate that fatty acid supplements also reduce hyperactivity and improve cognition in children with a variety of learning disabilities.

"Dietary polyunsaturated fatty acids improve histological and biochemical alterations in rats with experimental ulcerative colitis," N. Nito, M. I. Torres, A. Rios, and A. Gil, *Journal of Nutrition*, Vol. 132, No. 1, January 2002, 11-19. Address: Natalia Nieto, Dept. of Biochemistry and Molecular Biology, University of Granada, 18071 Granada, Spain. (See also: "The right fats," B. Harder, *Science News*, January 26, 2002, p. 53.)

Bell, Gordon, presentation to the Oxford Conference, "Can Fatty Acid Supplements Help?," September 22, 2001.