

Biomedical Update:

Fatty acids benefit teens with ADHD

Disruptive teenagers became calmer when taking supplements of essential fatty acids, according to a new report by Madeleine Portwood and colleagues.

In an open trial, the researchers studied 20 adolescents, ranging in age from 12 to 15, diagnosed with attention deficit hyperactivity disorder (ADHD). At the start of the study, 19 of the subjects had moderate or severe ADHD symptoms, 19 had short attention spans, and 18 were extremely impulsive. After taking the supplements for three months, less than one-third of the teens exhibited severe ADHD and severe impulsivity, and fewer than one-sixth exhibited severe attention problems.

The supplements used by Portwood et al. provided 500 mg of eicosapentaenoic acid (EPA), as well as high levels of docosahexaenoic acid (DHA), GLA, and vitamin E.

Portwood calls the results "stunning," adding, "These trials were undertaken with a group of potentially vulnerable students with persistent behavioral difficulties who were at risk of exclusion. By taking the fatty acid supplement, those aspects of their behavior which put them at risk of exclusion improved dramatically." Results of the study will appear in the book series *Nutrition and Health*.

According to Portwood, a study currently being conducted by the same research group is examining the effects of fatty-acid supplementation on the food intolerance of 80 autistic children.

"ADHD teens calmed by omega oils," www.nutraingredients.com, March 28, 2006.

"Fish oil helps unruly youths, study finds," *Lindsay Moss, The Scotsman*, March 28, 2006.

"Study shows fish oils can transform the behavior of disruptive teenagers," *Health World*, April 5, 2006.

Five-in-one vaccine: is it really safer?

The five-in-one immunization Pediacel (to be marketed in the U.S. as Pentacel) contains vaccines for diphtheria, tetanus, pertussis, Hib influenza, and polio. It is being billed as a safer vaccine, because it contains no thimerosal and uses an inactivated polio virus. However, data from the vaccine's manufacturer reveal that two-thirds of children experience systemic reactions to the vaccine, with a significant number suffering severe reactions.

Pediacel's manufacturer, Sanofi Pasteur, states in information recently provided to the British government's Medicines Healthcare Regulatory Authority, "In controlled clinical studies performed with Pediacel, 71% of 451 infants immunised at 2, 4 and 6 months experienced a reaction (pain, erythema or edema) at the injection site within the first 24 hours after vaccination. In 16% of infants the reaction was of moderate to severe intensity. Also, 64% of infants experienced a systemic reaction, which was of moderate to severe intensity in 16%."

British physician Peter Mansfield, a critic of the MMR and other combined-vaccine immunizations, commented on the Sanofi Pasteur statistics, saying, "This is scandalous. We're vaccinating babies when their immune systems are not ready."

The Sanofi Pasteur report to the Medicines Healthcare Regulatory Authority is available online at <http://emc.medicines.org.uk/emc/assets/c/html/displaydoc.asp?documentid=15257>.

Plasma magnesium low in autistic children

Italian researchers report that children with autism have low plasma concentrations of magnesium, a mineral crucial to a wide range of biological functions. The finding is consistent with a large body of evidence showing that magnesium, particularly in combination with vitamin B6, benefits autistic children.

Mirella Strambi and colleagues measured plasma and erythrocyte concentrations of magnesium in 12 children with autism, 17 with other autism spectrum disorders, and 5 with Rett syndrome, comparing them to 14 non-disabled controls. They found no differences in intracellular magnesium between the children with disabilities and the controls. However, they say, "autistic children and children with other autistic spectrum disorders had significantly lower plasma concentrations [of magnesium] than normal subjects."

Strambi and colleagues say, "Although our study population was small, we conclude that children with autistic spectrum disorders require special dietary management. If these cases are diagnosed at an early stage, they can be helped through diet."

"Magnesium profile in autism," Mirella Strambi, Mariangela Longini, Joseph Hayek, Silvia Berni, Francesca Macucci, Elisa Scalacci, and Piero Vezzosi, *Biological Trace Element Research*, Vol. 109, No. 2, February 2006, 97-104. Address: Mirella Strambi, Dept. of Paediatrics, Obstetrics and Reproductive Medicine, Section of Neonatology and Preventive Medicine, Azienda Universitaria Ospedaliera Senese, Policlinico Le Scotte, Siena, Italy.

Neurofeedback may aid mirror neuron function

Neurofeedback therapy may improve imitation skills in autistic individuals, according to a pilot study.

Last year (see ARRI 19/1), a research team including Jaime Pineda reported that mirror neurons did not function correctly in people with autism. These neurons, first identified in monkeys, are nicknamed "monkey see, monkey do" neurons because they fire not only when a monkey performs an act itself, but also when a monkey watches another monkey performing the action.

Mirror neuron action is indicated by suppression of "mu rhythm," a brainwave pattern that is blocked when the brain is doing, seeing, or imagining action. In autistic individuals, the researchers found, mu wave suppression occurred only in response to their own actions, not to those of another person.

Pineda and colleagues, noting that mu rhythms can be "trained," recently conducted a pilot study of the effects of neurofeedback therapy on mu wave patterns. Eight autistic children participated in 30 half-hour therapy sessions over 10 weeks, with a control group participating in similar activities but not receiving neurofeedback therapy.

In the neurofeedback sessions, the children learned to sit still and concentrate in order to keep a race car in a video game moving. In addition, five of the children learned to use mu waves to control the speed of the car. The researchers report that these five children exhibited significant changes in mu wave patterns, and also improved their scores on tasks involving imitation. However, Pineda and colleagues say that it is not clear if these changes will be permanent.

Neurofeedback is a non-invasive technique that enables a participant to use electrical signals from the brain to create changes in the environment, via electrodes attached to the scalp. Often, as in this study, participants are not consciously aware that they are controlling these changes. A number of studies have reported that neurofeedback can be useful in treating attention deficit hyperactivity disorder, depression, and other cognitive or mood disorders.

Pineda et al. reported their findings at the annual meeting of the Cognitive Neurosciences Society in San Francisco in April 2006. See "Brain training can change autistic behavior," *New Scientist*, April 22, 2006, for a more detailed report. Address: Jaime Pineda, Department of Cognitive Science 0515, University of California, San Diego, 9500 Gilman Drive, La Jolla, CA 92093-0515, pineda@cogsci.ucsd.edu.