Biomedical/Education Update:

Zinc aids ADHD kids

A new study shows that zinc is a valuable supplement for children with attention deficit hyperactivity disorder (ADHD).

Mustafa Bilici and colleagues randomly assigned 400 children with ADHD to take either a placebo or 150 mg per day of zinc sulfate [35 mg elemental zinc] for 12 weeks. The researchers evaluated the subjects' symptoms using an ADHD scale, an adaptation of the Conners Teacher Questionnaire, and a parent rating scale.

The researchers report that while the treatment had no effect on attention problems, subjects taking zinc "showed significant improvement in hyperactivity, impulsivity and socialization scores." Older children with higher body mass indexes, low initial zinc levels, and low levels of free fatty acids were the best responders.

Bilici et al. note that zinc is involved in the production of the neurotransmitter serotonin, and that low serotonin levels are linked to a variety of behavior problems including impulsivity. Zinc is also integral to the production and modulation of the hormone melatonin, which helps regulate dopamine function. Abnormal dopamine levels are a consistent finding in ADHD.

In addition, zinc is involved in the metabolism of essential fatty acids, which in turn help regulate dopamine and norepinephrine metabolism. Bilici and colleagues found in their study that zinc treatment resulted in a rise in both zinc and free fatty acids.

Because zinc did not all reduce all symptoms of ADHD, the researchers say, it should be used as an adjunct to other treatments.

Editor's Note: Zinc is one of many needed nutrients. Even better results are seen when a combination of nutrients is given, e.g., zinc, magnesium, B6, C, E, etc.

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"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, Dept. of Psychiatry, Karadeniz Technical University, School of Medicine, Trabzon, Turkey, bilici@msn.com.

Alzheimer's drug tested

A drug commonly used to treat Alzheimer's disease may benefit some autistic individuals as well, according to a new study.

Michael Chez et al. administered rivastigmine tartrate (Exelon) to 32 autistic individuals in a 12-week, open-label study. The researchers report that treatment resulted in significant improvements in both expressive speech and overall autistic behavior. Their findings support earlier research, also by Chez et al., showing that a similar Alzheimer's drug, donepezil (Aricept) improved speech and reduced autistic symptoms in autistic children. Both drugs are acetylcholinesterase inhibitors, which work by increasing the level of acetylcholine in the brain.

Common side effects of rivastigmine include nausea and vomiting. Additional adverse effects can include anxiety, aggression, confusion, hallucinations, depression, tremors, dizziness, fainting, headache, insomnia, high blood pressure, and weakness.

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"Treating autistic spectrum disorders in children: utility of the cholinesterase inhibitor rivastigmine tartrate," M. G. Chez, M. Aimonovitch, T. Buchanan, S. Mrazek, and R. J. Tremb, *Journal of Child Neurology*, Vol. 19, No. 3, March 2004, 165-9. Address: Michael Chez, mchezmd@sbcglobal.net.

Study links vaccines to autoimmune disorders

More evidence indicating that vaccination can disrupt immune function in susceptible individuals comes from a study by Guillaume Ravel and colleagues in France.

The researchers studied mice genetically predisposed to develop a disorder similar to lupus (an autoimmune disease in which the body attacks its own cells). The researchers already knew that the toxic substance mercuric chloride sometimes induces the lupus-like disorder in these mice, but wanted to find out if vaccination increased this risk.

Ravel and colleagues divided the mice into four groups. One group received high-dose hepatic B vaccine plus mercuric chloride; another received low-dose vaccine plus mercuric chloride; and a third received mercuric chloride alone. The fourth group, which served as a control, received water injections only.

The researchers report, "a marked increase in serum IgG levels and a slight increase in antinuclear autoantibody levels were seen in the mice given [the higher dose] of the vaccine plus mercuric chloride." This finding, the researchers say, appears to support the theory that "vaccination could enhance the risk of autoimmunity in genetically susceptible individuals when exposed to certain environmental chemicals." They caution, however, that their results are based solely on experimental conditions, and need to be verified.

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"Autoimmunity, environmental exposure and vaccination: is there a link?" G. Ravel, M. Christ, F. Horand, and J. Descotes, *Toxicology*, Vol. 196, 2004, 211-16. Address: Guillaume Ravel, MDS Pharma Services, 69210 St. Germain sur l'Arbresle, France, guillaume.ravel@mdsps.com.

Autistic teens learn to use pagers to seek aid when lost

Because autistic individuals have few social skills, they can experience serious difficulty if they become lost. Training these individuals to respond to vibrating pagers can help solve this problem, according to a recent study.

Bridget Taylor and colleagues worked with three autistic teenagers, all of whom exhibited significant language, social, and self-care deficits. The researchers trained the teens to respond to a vibrating pager by approaching an adult, saying "excuse me," and offering a communication card containing the autistic person's name, a statement that he or she was lost, and instructions to call the person's teacher or parent.

To teach this technique, the researchers used the following steps, repeating each step until the participants achieved a 100 percent success rate:

- Participants first learned how to hand the communication card to a familiar adult at school, in response to a signal from the pager. Verbal and manual prompts were gradually faded.
- Participants next practiced this skill in two different community settings.
- Trainers then left participants alone in a variety of community settings, while observing them covertly, to see if they would approach a nonfamiliar individual and produce the communication card.
- In the final step, parents rather than trainers accompanied the participants to public places, again leaving them alone and signaling them with the pager.

Taylor et al. report, "All three participants learned to produce the card in response to the vibrating pager at school and at the community training sites." They note that it may be possible to refine this procedure by training autistic individuals to approach adults who are the most likely to be helpful and not dangerous (for instance, store clerks).

They also note that since autistic individuals can learn to respond to pagers, it may also be possible to teach them to activate a cell phone in order to make or receive calls if they become lost.

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"Teaching teenagers with autism to seek assistance when lost," Bridget A. Taylor, Carrie E. Hughes, Erin Richard, Hannah Hoch, and Andrea Rodriquez Coello, *Journal of Applied Behavior Analysis*, Vol. 37, No. 1, Spring 2004, 79-82. Address: Bridget A. Taylor, Alpine Learning Group, 777 Paramus Road, Paramus, New Jersey 07652, algbt@opcenter.net.