

Biomedical/Education Update:

R-THBP: positive effect on social behavior

Tetrahydrobiopterin (THBP) is a naturally occurring coenzyme involved in a wide range of metabolic processes affecting neurotransmitter synthesis. Japanese researchers first reported in 1987 that THBP could reduce autistic symptoms, following up in 1990 with two studies replicating their results (see ARRI 1/4 AND 4/4). A new study, by researchers in Sweden and Japan, also reports positive findings.

In a double-blind crossover study, Torsten Danfors and colleagues identified 12 young autistic boys with low cerebrospinal fluid concentrations of THBP and administered 3 mg of THBP per kilogram daily to the children for six months, alternating with a placebo. The boys' scores on the Childhood Autism Rating Scale (CARS) showed only non-significant changes overall, but the researchers say improvements in three core areas—communication, social interaction, and stereotypy—were significant. The data also showed a strong correlation between higher IQ and improvements in social behavior.

“Tetrahydrobiopterin in the treatment of children with autistic disorder: a double-blind placebo-controlled crossover study,” T. Danfors, A. L. von Knorring, P. Hartvig, B. Langstrom, R. Moulder, B. Stromberg, R. Torstenson, U. Wester, Y. Watanabe, and O. Eeg-Olofsson, *Journal of Clinical Psychopharmacology*, Vol. 25, No. 5, October 2005, 485-9. Address: Torsten Danfors, Department of Neuroscience, Uppsala University, Uppsala, Sweden.

Secretin responders: biochemistry a clue

The hormone secretin causes remarkable improvement in some autistic children, while other children respond poorly or not at all. A new study, which analyzed biochemical changes in secretin responders and non-responders, offers insight into why some children benefit from secretin treatment while others do not.

Yoshihiro Toda and colleagues administered secretin intravenously to 12 autistic children between the ages of four and 16. The researchers analyzed treatment-induced changes in subjects' cerebrospinal fluid levels of the dopamine metabolite HVA, the secretin metabolite 5-HIAA, and the coenzyme tetrahydrobiopterin (BH4) which is involved in neurotransmitter synthesis (see related article above).

Seven of the 12 children in the study benefited significantly from secretin treatment,

as evidenced by improved scores on the Autism Diagnostic Interview-Revised (ADI-R). In particular, the researchers say, six children became markedly more social and four showed improvements in language and communication, with responders exhibiting “frequent eye contact, smile return, an increase in the number of words, and obedience to a person's instructions.” Four children also exhibited fewer destructive behaviors. Two children, however deteriorated, while the remainder did not change significantly. The researchers report, “The HVA and BH(4) levels in CSF were increased in all children with improvement in the ADI-R score. In contrast, no patient without the elevation of the BH(4) level showed improvement in the score.”

The researchers conclude, “These findings suggest that secretin activated metabolic turnover of dopamine in the central nervous system via BH(4), improving symptoms.” They note that children younger than 10 responded best to secretin, possibly highlighting the importance of BH(4) in early development of the nervous system.

“Administration of secretin for autism alters dopamine metabolism in the central nervous system,” Yoshihiro Toda, Kenji Mori, Toshiaki Hashimoto, Masahito Miyazaki, Satoshi Nozaki, Yasuyoshi Watanabe, Yasuhiro Kuroda, and Shoji Kagami, *Brain and Development*, Sept. 14, 2005. Address: Yoshihiro Toda, Dept. of Pediatrics, School of Medicine, University of Tokushima, 3-18-15, Kuramoto-cho, Tokushima-shi, Tokushima 770-8503, Japan.

Fever linked to better behavior in autism

Supporting many anecdotal reports by parents, a new study shows that some autistic children improve significantly when they have fevers.

Laura Kresch Curran and colleagues used the Aberrant Behavior Checklist to evaluate 30 autistic children at three points: when the children had fevers greater than 100.4; when the fevers broke and the children were recovering; and when the children were fever-free for seven days. The children were matched according to sex, age, and verbal skills with autistic children who were fever-free, and the control children's behavior also was rated over a three-day period.

Using the Aberrant Behavior Checklist, The researchers found that fevers were associated with improvement on the subscales of irritability, stereotypy, hyperactivity, and inappropriate speech. Curran et al. conclude, “Fever may positively affect brain function through an underlying mechanism important

to this group of disorders, possibly involving immunological and neuroendocrinological mechanisms.”

“A study of behaviors associated with fever in children with autism/PDD,” L. Curran, S. Crawford, C. Newschaffer, and A. Zimmerman, presentation at the International Meeting for Autism Research, May 5, 2005.

Magnet treatment reduces depression without memory loss

Repetitive transcranial magnetic stimulation (rTMS)—a treatment currently being investigated as a treatment for autism—is an effective treatment for severe depression and does not cause memory loss, according to a recent study.

Svenja Schulze-Rauschenbach and colleagues treated 30 patients with severe depression, all of whom had failed to respond to other therapies, with either electroconvulsive therapy or rTMS. In rTMS therapy, a coil placed on the patient's forehead produces a strong pulsating magnetic field which in turn produces an weak electric current.

The researchers say that patients treated with rTMS did as well as those receiving electroconvulsive therapy, with about half of patients in each group improving. “In patients treated with rTMS,” the researchers say, “cognitive performance remained constant or improved and memory complaints alleviated, whereas in the ECT group memory recall deficits emerged and memory complaints remained.”

“Distinctive neurocognitive effects of repetitive transcranial magnetic stimulation and electroconvulsive therapy in major depression,” Svenja C. Schulze-Rauschenbach, Uta Harms, Thomas E. Schlaepfer, Wolfgang Maier, Peter Falkai, and Michael Wagner, *British Journal of Psychiatry*, Vol. 186, 2005, 410-16. Address: Michael Wagner, Department of Psychiatry, University of Bonn, Sigmund-Freud-Str. 25, D 53105 Bonn, Germany, michael.wagner@ukb.uni-bonn.de.

SCHOOLS AND SERVICES

The Autism Research Institute maintains a list of schools and services for autistic individuals. If your facility should be included on our list, and you believe it may not be, please send a self-addressed, stamped envelope to receive our referral list questionnaire.