Auditory Integration Training (AIT) Update

Approximately 500 autistic individuals have been given auditory integration training as part of a second study of AIT by our Institute, in conjunction with researcher Steve Edelson. AIT, designed to reduce oversensitivy to sound and other symptoms of autism, involves having subjects listen to electronally-modified music through headphones.

An in-depth analysis of six-month and nine-month follow-up data is currently underway. (Half of the sample is being followed monthly for six months, while the other half is being followed for nine months.) Complete data have been collected and analyzed thus far for about 375 subjects. Analysis to date indicates that:

- The relatively inexpensive ($4,000) U.S.-made AIT device (the BGC instrument) appears to produce results as good as the more expensive ($8,400) Berard device imported from France.
- Thus far there appears to be no advantage to subjects for whom filters have been used, as compared to subjects for whom filters have been omitted. Heretofore, the use of the filters has been considered an essential part of AIT, but filter use presents problems, since it requires that an audiogram be obtained from the autistic children—not an easy task. If this finding holds up, it will greatly simplify and facilitate giving the AIT treatment.
- The behavioral improvements appear to be stable, and in fact to increase slightly over time.
- There seems to be a tendency for the lower-functioning autistic people to show the greatest improvement.

The amount of data collected is enormous, and it will take many more months to complete the analysis, but we feel the foregoing findings are very likely to be supported when the analysis is complete. Our preliminary analysis supports the findings of our pilot study in 1992 which found that AIT is a promising treatment option, although its validity is not as yet conclusively established.

Dr. Edelson has recently returned from Cambridge, Massachusetts, where he completed testing for another double-blind evaluation of AIT. Collaborators in the Massachusetts study were neurologists Margaret Bauman and Paul Hardy. Follow-up testing is underway, and preliminary results are expected to be available by year's end.

Ohio study findings positive

In a non-blind study, Tina Veale et al. tested AIT on 46 autistic subjects, using four parent questionnaires to measure results. They report that "all measures exhibited clear statistical evidence for improvements . . . all improvements were essentially found at the one month time period, with sustained improvement over the six month follow-up period." Improvements included reductions in hyperactivity, withdrawal, auditory problems, restlessness, and anxiousness. The Berard and BGC devices produced essentially similar results.

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"Auditory Integration Training: where are we now?," Tina K. Veale, presented at the 1993 World of Options International Autism Conference, sponsored by the Autism Society of Canada and the Autism Society of America; July 16, 1993.

Tryptophan depletion worsens symptoms

Reducing levels of the amino acid tryptophan in an autistic woman's diet resulted in a worsening of her symptoms, according to a new study by Christopher McDougle et al. The researchers report that their 35-year-old subject responded to tryptophan depletion with "a marked exacerbation of anxiety, depression, anger, irritability, agitation, and perseveration." By contrast, when tryptophan was added to her diet, she showed mild improvement.

McDougle et al. were interested in studying the effects of tryptophan depletion on autistic subjects because the brain chemical serotonin is synthesized from tryptophan, and abnormal serotonin levels occur in about a third of autistic individuals. The researchers cite previous research demonstrating that levels of dietary tryptophan can directly influence serotonin levels.

Tryptophan, an essential amino acid, has been removed from the market by the FDA, following an incident several years ago in which a Japanese manufacturer accidentally introduced contaminants into its tryptophan synthesizing process, resulting in a number of illnesses and several deaths. Although the process which allowed the contamination is no longer used by any manufacturers of tryptophan, the FDA has refused to lift its ban on the substance. *(See related article on page 1.)*

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"Acute tryptophan depletion in autistic disorder: a controlled case study," Christopher J. McDougle, Susan T. Naylor, Wayne K. Goodman, Fred R. Volkmar, Donald J. Cohen, and Lawrence H. Price; *Biological Psychiatry*, 1993, 33, pp. 547-550. Address: Christopher J. McDougle, Yale University School of Medicine, Connecticut MHC, Clinical Neuroscience Research Unit, 34 Park St., New Haven, CT 06519.

New research shows Prozac effective in treating self-injury

A new report by Robert Ricketts et al. adds to a growing body of evidence that fluoxetine (Prozac) can significantly reduce self-injury in mentally retarded individuals.

In an open trial, Ricketts and colleagues treated four adult patients with long-standing and severe self-injury. "Each of these individuals benefitted from fluoxetine to some extent," the researchers say, "with average decreases in self-injury ranging from 20% to 88% when compared with baseline levels."

Another recent study, by P. I. Markowitz, found that 18 of 20 self-injurious subjects treated with fluoxetine showed improvement, sometimes marked. All of Markowitz's subjects, who ranged in age from 17 to 56 years, were retarded, and six had concurrent psychiatric diagnoses including autism, schizophrenia, obsessive-compulsive disorder, depressive disorders, and atypical psychosis. One patient was dropped from the study because of adverse effects. An earlier study by Markowitz, involving eight self-injurious retarded subjects, found that "within one month of instituting fluoxetine therapy at 20 mg/day, all eight had demonstrated symptomatic improvement both in self-injury and self-stimulatory behaviors (e.g., rocking, twirling, handflapping)."

Last year, ARRI reported on a study by Edwin Cook et al., who found that 15 of 23 autistic subjects and 10 of 16 retarded subjects responded positively to Prozac treatment. Levels of self-injury, aggression, and obsessive-compulsive behaviors dropped significantly, but nine subjects did experience significant adverse effects including hyperactivity and agitation.

In all, Ricketts says, there are 44 cases in the literature involving self-injury treated with fluoxetine, and in 42 of these cases positive results were seen. "These findings," Ricketts says, "...emphasize the need for well-controlled studies to more adequately assess the effects of fluoxetine on self-injury." While results are encouraging, Ricketts notes, "clinicians should note that adverse behavioral side effects have been associated with the use of fluoxetine in children and adolescents, including motor restlessness, sleep disturbance, social disinhibition, a subjective sensation of excitation, and mania. Furthermore, in a study of 42 children and adolescents with obsessive-compulsive disorder, treatment with fluoxetine was associated with the emergence or worsening of self-injurious ideation or behavior in six subjects." The drug also has been linked to suicidal and homicidal episodes in non-autistic individuals.

Noting that fluoxetine increases serotonin levels by inhibiting reuptake of the neurotransmitter, Ricketts suggests that future studies differentiate between subjects with and without impaired functioning of the serotonergic system, "as this may be a marker for drug responsiveness."

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"Fluoxetine treatment of severe self-injury in young adults with mental retardation," *Journal of the American Academy of Child and Adolescent Psychiatry*, July 1993, Vol. 32, No. 4, pp. 865-869. Address: Robert W. Ricketts, Southwest Institute for Developmental Disabilities, Abilene, Texas.