Biomedical Update:

Prism lenses reduce autistic symptoms, improve performance

The poor eye contact, toe walking, and odd neck and body postures of many autistic individuals may be due to vision problems, according to a new study that suggests that these abnormal symptoms can be reduced by corrective lenses.

Melvin Kaplan et al. suggest that autistic children have abnormal "ambient vision," the type of vision used to orient oneself to the environment, movement, and depth. "The symptoms demonstrated by autistic children," the researchers say, "may be an adaptation to an ambient visual system that has distorted the appearance of the spatial environment."

Kaplan et al. studied 14 autistic children between the ages of 4 and 15, noting their head positions and body posture during activities such as watching television, balancing on a beam, or catching a ball. In addition, the researchers studied the facial expressions of the children. Then they evaluated the children's head positions, posture, and facial expressions when corrective prism lenses (clear glass lenses slightly thicker at the top or bottom) were introduced. The researchers' findings:

- Children who previously tilted their heads during activities were significantly more likely to hold their heads erect, in the correct position, while wearing the lenses.
- In the ball-catching task, the prism glasses led to an increase in active catches, and a decrease in passive catches and misses. "Performance improvements in the group were immediate," the researchers report, saying that "head tilt, posture, and interaction with a moving object were improved."
- The children's facial expressions were generally much less tense while they were wearing the corrective lenses.

Kaplan et al. conclude that professionals should consider incorporating corrective ambient lenses into standard treatment programs for autism. The higher level of performance seen in autistic individuals wearing the glasses, they say, "may lead to improved interaction with others at school and play, and perhaps a more pleasurable interaction with the environment."

More positive results

Optometrist Randy Schulman has also reported seeing marked improvements in autistic individuals treated with both traditional prescription glasses and special lenses and prisms that alter sensory input. Schulman reported in 1994 that "of the cases in which I had the opportunity to do vision therapy, ...25% [of patients] made slow progress, 30% made fair progress, and 45% made good progress." Schulman notes that farsightedness, intermittent strabismus (misalignment of the eyes), and other vision problems are frequently encountered in autistic individuals. Schulman suggests that autistic symptoms such as poor visual pursuit and fixation may be linked to cerebellar defects reported by autism researchers.

Schulman cites Donna Williams, a well-known author with autism, who benefited dramatically from wearing tinted (Irlen) lenses. Williams stated that when she put on her glasses for the first time, "the room didn't seem so crowded, overwhelming or bombarding. The background noise I had always heard before was not even apparent." Schulman speculates that for autistic individuals, special lenses and prisms "may break the dependence on an inflexible structure based on misperceptions."

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"Postural orientation modifications in autism in response to ambient lenses," Melvin Kaplan, Dennis P. Carmody, and Alexa Gaydos, *Child Psychiatry and Human Development*, Vol. 27, No. 2, Winter 1996, pp. 81-91. Address: Melvin Kaplan, Center for Visual Management, 150 White Plains Road, Suite 410, Tarrytown, NY 10591.

—and—

"Optometry's role in the treatment of autism," Randy L. Schulman, *Journal of Optometric Vision Development*, Vol. 25, Winter 1994. Address: Randy Schulman, 5 Eversley Avenue, Norwalk, CT 06851.

Increased chromosome breakage seen in autistic individuals

Many cases of autism appear to have genetic roots, but the nature of the genetic insults that contribute to autism is unclear. In a new study, French researchers suggest that "[a] tendency toward chromosome breakage may be part of what is described as the 'genetic influence on autism.'"

Isabel Arrieta et al. analyzed the chromosomes of 30 autistic children and 30 nondisabled children, all of Basque ancestry. Children with tuberous sclerosis, fragile X syndrome, and other known or suspected genetic disorders were excluded.

The researchers found that "the frequency of chromosome breakage [was] significantly higher in autistic [subjects] than in the control sample." It is not clear, they say, whether these chromosomal fragile sites result from medications such as anticonvulsants, which may reduce levels of folic acid and contribute to the expression of fragile sites, or from an underlying condition causing the children's autism. They also note that an increase in fragile sites has been reported in mentally retarded children.

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"Autosomal folate sensitive fragile sites in an autistic Basque sample," Isabel Arrieta, Teresa Nuñez, A. Gil, Piedad Flores, Elena Usobiaga, and Begoña Martinez; *Ann Genét*, Vol. 39, No. 2, 1996, pp. 69-74. Address: Isabel Arrieta, Lab Genética, Dpto. Biologia Animal-Genética, Fac. Ciencias, U.P.V./E.H.U. Apdo 644-48080, Bilbao, Spain.

Clomipramine: more mixed results

ARRI 10/3 reported studies suggesting that clomipramine (Anafranil), a non-selective serotonin reuptake inhibitor, is ineffective and often dangerous for young children with autism, but may be useful in treating adults with mental retardation. A new study by Mark Lewis and colleagues also reports positive results with clomipramine in retarded adults, but cautions about adverse effects.

In a double-blind, placebo-controlled crossover study, Lewis et al. administered clomipramine to eight self-injurious mentally retarded adults, some with mild or moderate autistic symptoms but none diagnosed as autistic. The subjects had failed to respond to other treatments ranging from drug therapies and behavior modification to contingent electric shock.

The researchers say that six of the subjects "exhibited a clinically significant improvement (50% or greater reduction from placebo) in the frequency of self-injurious behavior," and that treatment also resulted in "improvement in self-injurious behavior intensity, frequency of stereotypy and compulsions, teacher ratings of stereotypy and social withdrawal, and frequency of staff intervention required for problem behaviors." Two subjects also showed a decrease in self-restraining behaviors (such as wrapping their arms in clothing or squeezing their hands together, apparently to prevent self-injury).

Lewis and colleagues note that two of their eight subjects experienced serious side effects: one had a seizure, and another exhibited persistent tachycardia, increased aggression, and agitated behavior. Other side effects seen during clomipramine treatment included constipation, increased appetite, heart pounding (in half of the subjects), and increased frequency of urination.

ARRI 10/3 reported on a study by Laura Sanchez et al. on the effects of clomipramine on eight autistic children. Of the subjects, one dropped out due to severe side effects requiring catheterization, one improved moderately, and six were rated as worse. In addition, Sanchez reported, side effects were "serious and common." A 1993 study of older autistic subjects by Charles Gordon et al. found that clomipramine reduced stereotypies, compulsions, anger, and self injury in autistic subjects, and increased social interaction; however, two of Gordon's subjects experienced cardiac abnormalities and one had a seizure.

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"Clomipramine treatment for self-injurious behavior of individuals with mental retardation: a double-blind comparison with placebo," Mark H. Lewis, James W. Bodfish, Susan B. Powell, Dawn E. Parker, and Robert N. Golden; *American Journal on Mental Retardation*, Vol. 100, No. 6, 1996, pp. 654-665. Address: Mark H. Lewis, Department of Psychiatry, College of Medicine, University of Florida, P.O. Box 100256, Gainesville, FL 32610-0256.