

Biomedical Update (continued):

More clues about Asperger's

A new brain imaging study adds to evidence suggesting that Asperger's syndrome—a variant of high-functioning autism—involves abnormalities of the right hemisphere of the brain.

J. Roger McKelvey et al. performed CT, MRI, and SPECT scans on three adolescents (two boys and one girl) with Asperger's. "In one subject," they report, "CT and MRI revealed enlargement of the right lateral ventricle [a fluid-filled cavity], reflecting a mild degree of right hemispheric atrophy." While CT and MRI scans of the other two subjects appeared normal, SPECT scans revealed abnormalities in all three subjects.

"The pattern of change was variable," McKelvey et al. say, "but there was some involvement of the right frontal lobe in all subjects." This is consistent, they say, with the role of the frontal lobes in comportment and social judgment, "both areas of prominent deficit in Asperger's syndrome." In contrast, the subjects did not show consistent abnormalities of the parietal lobes.

All three subjects also exhibited abnormalities of the cerebellum, a finding consistent with previous studies of autistic subjects. This finding, the researchers say, "adds weight to the argument that Asperger's syndrome is part of the same disease spectrum" as autism.

"Right-hemisphere dysfunction in Asperger's syndrome," J. Roger McKelvey, Raymond Lambert, Laurent Mottron, and Michael I. Shevell; *Journal of Child Neurology*, Vol. 10, No. 4, July 1995, pp. 310-314. Address: Michael Shevell, A-514, Montreal Children's Hospital, 2300 Tupper St., Montreal, Quebec, Canada H3H 1P3.

Do autistic children see motion differently?

According to a new French study, autistic individuals may have difficulty perceiving motion—a defect which could contribute to a number of autistic symptoms.

Bruno Gepner et al. studied five autistic children between the ages of four and seven, as well as 12 non-disabled controls. The children stood on platforms capable of measuring their changes in posture as a result of viewing moving images projected onto a screen in a darkened room. The researchers report that the autistic subjects were "quite insensitive to visually perceived environmental motion," as well as exhibiting more unstable posture while viewing the moving scenes.

Gepner et al. suggest that impairments affecting the development of motion perception could result in social deficits during infancy and/or childhood—for instance, by making it difficult for autistic individuals to understand other people's changing facial expressions and gestures. In addition, they say, a defective ability to perceive motion

could help account for the abnormal movements, gait and posture of many autistic individuals, as well as their poor ability to imitate others.

"Postural effects of motion vision in young autistic children," Bruno Gepner, Daniel Mestre, Guillaume Masson, and Scania de Schonen; *Cognitive Neuroscience and Neuropsychology*, Vol. 6, No. 8, May 1995, pp. 1211-1214. Address: Bruno Gepner, Service de Psychiatrie de l'Enfant et de l'Adolescent, CHS Valvert, Bvd des Libérateurs, 13011 Marseille, France.

Excess vitamin A linked to birth defects

Recently scientists reported that supplementation of pregnant women with the B vitamin folic acid greatly reduces the incidence of neural tube disorders. A new report, however, says that another nutrient—vitamin A—can, if consumed in excess by expectant mothers, increase the risk of birth defects in their children.

Kenneth Rothman et al. studied 22,748 pregnant women between 1984 and 1987. Subjects were divided into two groups based on their vitamin A intake.

The data showed that taking four times or more the recommended amount of vitamin A increases a woman's risk of having a child with a birth defect affecting the face, head, brain, or heart. The researchers estimate that 1 in 57 infants of the mothers with a vitamin A intake of over 10,000 IU per day suffered birth defects as a result of the excess vitamin A. Because vitamin A is stored in body tissues, the researchers suggest that women who consume large amounts of the vitamin before becoming pregnant also may be putting their children at risk.

Rothman et al. note, however, that high consumption of beta carotene—a precursor to vitamin A, found in many vegetables and fruits—did not increase the risk of birth defects, since the body converts beta carotene into vitamin A only as needed. They conclude that pregnant women should consume recommended amounts of vitamin A, and eat foods rich in beta carotene, but should be careful not to exceed the current RDA of 2,700 IU of vitamin A per day.

The researchers advise women who are pregnant or planning to become pregnant to check their vitamin supplements, some of which contain 10,000 IU or more of vitamin A.

Editor's Note: Except for pregnant women, vitamin A toxicity is very uncommon, even when large amounts are taken. In a 1989 paper in the *American Journal of Clinical Nutrition*, Adrienne Bendich and Lillian Langseth noted that "in adults it is doubtful whether symptoms can occur at doses < 100,000 IU/d; in children the range is from 12,000 to > 500,000 IU/d depending on body size and weight."

"Excess vitamin A causes birth defects," Lisa Seachrist, *Science News*, Vol. 148, No. 16, October 14, 1995.

Long-term success reported with diet restricting gluten, casein

A gluten- and/or casein-free diet may greatly benefit some autistic individuals, according to a long-term study by Norwegian researchers (see related articles in ARRI 9/3, 7/1, and 1/2).

Ann-Mari Knivsberg et al. tested the urine of autistic subjects, and then selected 15 who had abnormal urine levels of peptides (protein fragments) possibly stemming from defective metabolism of gluten and casein. (Gluten is a protein found in wheat, oats, barley, and rye, while casein is a milk protein.)

The researchers placed these subjects on gluten- and casein-restricted diets. They report that during the first year of the diet parents reported marked improvements in all of the children, including increases in communication skills, social awareness, and learning. Reductions in stereotyped playing, odd body movements, emotional outbursts, resistance to change, and dislike of physical contact were also seen. "This positive development continued through the next three years," the researchers say, "though at a lower rate." Teacher ratings and standardized tests also revealed improvements in language and cognition.

"In addition to the increase in social, communicative and problem-solving abilities," the researchers report, "parents and teachers observed a change in motor abilities. The children moved with more assuredness and ease. They seemed to be more aware of their bodies... [and] bowel and bladder control increased." Parents and teachers noted more normal reactions in children with under-sensitivity to pain, and four children who suffered from seizures had fewer incidences while on the diet. Urine testing at the end of the first year, and at the conclusion of the study several years later, also showed that peptide levels were more normal.

While there was no control group in the study, Knivsberg et al. say that the length of the study, the remarkable improvements seen in the subjects during the first year on the diet, and the fact that none of the subjects regressed (as would have been expected), make their results "interesting and valuable."

Researchers have speculated that a metabolic disorder in some autistic children may allow neuroactive peptides to "leak" from the digestive system, and that these peptides may cause behavioral disturbances.

Editor's Note: See editorial, page 3, and related letter on page 7.

"Autistic syndromes and diet: a follow-up study," Ann-Mari Knivsberg, Karl Ludvig Reichelt, Magne Nodland, and Torleiv Høien; *Scandinavian Journal of Educational Research*, Vol. 39, No. 3, 1995. Address: Ann-Mari Knivsberg, Center for Reading Research, P.O. Box 2504 Ulandhaug, N-4004 Stavanger, Norway.