

# Biomedical update:

## MRI study shows brainstem defect

The brainstems of 13 high-functioning autistic patients were significantly smaller than those of control subjects, according to magnetic resonance imaging (MRI) studies conducted by Gary R. Gaffney et al.

When each brainstem area was considered separately, the only significant difference between autistic subjects and controls was in the pons, a structure located in front of the cerebellum. Gaffney notes that in the control group, the size of brainstem areas appeared to increase with age; this was not true in the autistic group.

"Morphological evidence for brainstem involvement in infantile autism," Gary R. Gaffney, Samuel Kuperman, Luke Y. Tsai, and Susan Minchin; *Biological Psychiatry*, 24, pp. 578-586, September 1988. Address: Gary R. Gaffney, Department of Psychiatry, University of Kansas Medical Center, Kansas City, KS 66103.

## Rett's: unusual neurotransmitter levels found

Tests on the cerebrospinal fluid (CSF) of 32 girls with Rett Syndrome revealed abnormally low levels of the metabolites (break-down products) of the neurotransmitters dopamine, serotonin and norepinephrine. The researchers (Huda Zoghbi et al.) also found elevated levels of tetrahydrobiopterin, a biochemical necessary for the synthesis of the three neurotransmitters.

The researchers note that abnormal CSF levels of dopamine, serotonin and norepinephrine are also seen in Parkinson's disease, Huntington's disease, Lesch-Nyhan syndrome, and DHPR deficiency—all disorders which share some features with Rett Syndrome.

Zoghbi et al. believe their results, and those of other Rett studies, indicate that the disorder may be caused by dysfunction in subcortical areas of the brain and/or in the brainstem. "The stereotypic hand movements [of Rett patients]," they say, "may represent dysfunction in the basal ganglia." The researchers note that autopsy studies on Rett patients have discovered reduced brain weight and brain abnormalities including decreased melanin in the substantia nigra, dopamine depletion in the corpus striatum, and reduced norepinephrine and serotonin levels in the hypothalamus and limbic system.

**Editor's Note:** in a previous *ARRI* (Vol. 1, No. 4), we reported on a Japanese study by Naruse and colleagues in which tetrahydrobiopterin was used as a treatment

for autism, with positive results in more than half of a group of 84 autistic subjects. The researchers commented that "R-THBP was most effective in improving those abnormal behaviors of autistic patients which seemed to be the core symptoms of the disease."

"Cerebrospinal fluid biogenic amines and biopterin in Rett syndrome," Huda Y. Zoghbi, Sheldon Milstien, Ian J. Butler, E. O' Brian Smith, Seymour Kaufman, Daniel G. Glaze and Alan K. Percy; *Annals of Neurology*, Vol. 25, No. 1, January 1989. Address: Huda Y. Zoghbi, Department of Pediatrics, Baylor College of Medicine, One Baylor Plaza, Houston, TX 77030.

## Vitamins reduce risk of neurological defects

Women who take multivitamins before and during pregnancy have less than half the chance of bearing a child with a serious neurological defect as women who don't, according to a report by Joseph Mulinare et al.

This large-scale study found that the risk of having a baby with neural tube defects—which cause disorders ranging from spinal bifida to anencephaly, or absence of major brain parts—was 60 percent less for women who took vitamins before and at the time of conception than it was for those who did not take supplements.

The researchers note that the mothers who took multivitamins also had other health and lifestyle characteristics which differed from non-users, and that these characteristics might also have affected their babies. However, they say their findings are supported by other evidence indicating that maternal vitamin deficiencies are linked to neural tube defects. For instance, neural tube defects are more common in babies of women in lower socioeconomic classes and other women with poor diets, and there was an "epidemic" of neural tube defects during the Depression.

A 1981 study by Richard Smithells found that mothers of children with neural tube defects were deficient in folic acid and vitamin C, and that taking vitamins greatly reduced their chances of having another affected child.

"Periconceptional use of multivitamins and the occurrence of neural tube defects," Joseph Mulinare, Jose F. Cordero, J. David Erickson and Robert J. Berry; *Journal of the American Medical Association*, Vol. 260, No. 21, December 2, 1988. Address: Joseph Mulinare, Division of Birth Defects and Developmental Disabilities, Centers for Disease Control, Atlanta, GA 30333.

## Sulpiride effective in one case

The drug sulpiride significantly reduced an 18-year-old autistic girl's behavior problems—problems which had not responded to other medications or to behavior modification—according to British researchers Derek W. Scott and Peter Eames.

Measurements taken before and after introduction of the drug showed that the girl conversed more spontaneously with others, stared into space less often, participated more in activities, and showed less strange behavior during treatment.

Following a relapse after more than a year on sulpiride, the dose was raised from 400 mg b.d. to 600 mg b.d. and the girl's behavior once again improved significantly.

Scott and Eames caution that this is only a pilot, non-placebo study, and that more testing is needed to see if sulpiride (which is not currently distributed in the U.S.) is a valuable treatment for autism.

"Use of sulpiride in a case of atypical autism," Derek W. Scott and Peter Eames, *Journal of Autism and Developmental Disorders*, Vol. 18, No. 1, March 1988, pp. 144-145. Address: Derek W. Scott, Research Unit, Friern Hospital, Friern Barnet Road, London N11 3BP, UK.

## Cerebral blood flow studied

The theory that autism may be linked to defects in the left hemisphere of the brain, or to a failure of the brain's hemispheres to fully specialize in their different functions, is supported by a new French study.

Nicole Bruneau and colleagues studied the blood flow in the middle cerebral arteries of eight autistic children and a control group. When responding to noise, the control group showed a higher blood flow in the left side of the brain than on the right; autistic subjects showed just the opposite response.

The right-side values for both groups were similar, while the left-side values for the autistic children were significantly lower than for the controls.

"Cerebral blood flow as assessed by transcranial Doppler ultrasonography in children with autistic behavior: preliminary results," Nicole Bruneau, Philippe Arbeille, Marie-Claude Dourneau, Bernard Garreau, Leandre Pourcelot and Gilbert Lelord; *C. R. Acad. Sci. Paris*, No. 308, Series III, pp. 255-260, 1989. Address: Nicole Bruneau, I.N.S.E.R.M., U 316, C.H.U. Bretonneau, 2, boulevard Tonnelie, 37044 Tours Cedex.