

Autism Research Review

I N T E R N A T I O N A L

A quarterly publication of the Autism Research Institute

Reviewing biomedical and educational research in the field of autism and related disorders

More evidence links autism, cerebellar defects

In 1987, Eric Courchesne and colleagues published a ground-breaking study linking abnormalities of the cerebellum to autism. Now they report new evidence of brain defects in autism—evidence that provides intriguing clues about the possible roots of autistic behaviors, and challenges long-held views about the functions of the cerebellum.

In a new magnetic resonance imaging (MRI) study involving 50 autistic subjects

and 53 nondisabled controls, the researchers have identified two types of cerebellar defects in autistic individuals. A large group of their subjects (86%) displayed hypoplasia (underdevelopment) of cerebellar vermician lobes VI and VII, the same finding Courchesne et al. reported earlier; but a smaller group (12%) displayed *hyperplasia*, or overdevelopment, of the same areas.

While most subjects showed hypoplasia, the defects seen in the hyperplastic subjects were more marked. Defects

were seen in subjects of all ages, and almost none of the subjects had normal cerebellar measurements.

Earlier "negative" results now reveal cerebellar defects

The new findings, the researchers say, explain why some researchers were unable to replicate Courchesne's original work. "If the autistic samples in some MRI studies that did not detect cerebellar hypoplasia were actually composed of *both* the hypoplasia and hyperplasia subtypes," they note, "then the autistic mean size reported in such studies would have appeared to be near the normal mean size only because it would be the sum of the two opposite subtypes." In-

continued on page 7

The FDA front: call/write/visit Congress now!

As readers of the ARRI know, some of the safest and most effective treatments available for autism and many other disorders are certain nutritional supplements. As one example, the use of high-dosage vitamin B-6 and magnesium in the treatment of autistic children and adults has now been confirmed in 18 consecutive studies, and there have been no studies which failed to show positive effects on autistic individuals, nor any studies showing adverse effects. There are of course many thousands of studies showing nutritional supplements to be extremely effective in preventing heart disease, cancer and many other common illnesses. Adverse effects are virtually unknown. Yet, despite the overwhelming evidence for the safety and efficacy of nutritional supplements, the Food and Drug Administration (FDA) has, for many decades, fought against the public's right to purchase supplements. They would rather we buy expensive and often harmful prescription drugs.

As a consequence of the enormous outpouring of public indignation against the FDA's efforts to deprive us of our right to purchase nutritional supplements, a number of Senators and Congressmen have initiated legislation to block the FDA's efforts.

At present, there are several very important bills undergoing review in both the Senate and the House which would prevent the FDA from implementing its plans. This anti-FDA legislation must be passed this session of Congress, or the process of attempting to block the FDA will have to be restarted from the beginning. Readers are urged to telephone, write, and, most impor-

continued on page 2

Long-awaited F/C report
issued: page 2

Courchesne's Research In Summary

THE CEREBELLUM or "little brain," located at the base of the brain beneath the back of the cerebrum, is a small, oval-shaped structure consisting of two deeply wrinkled lobes and a middle section, called the vermis (from the Latin word for "worm") because of its worm-like shape. Known functions of the cerebellum include coordinating voluntary muscle activity and maintaining equilibrium.

FINDINGS BY COURCHESNE et al.: Two areas of the cerebellar vermis (lobules VI and VII) are abnormally small (hypoplastic) in about 86% of autistic subjects, and abnormally large (hyperplastic) in about 12% of autistic subjects. While fewer subjects had hyperplasia, their defects were more marked.

THE PARIETAL LOBE is one of four lobes in each hemisphere of the CEREBRUM (the largest part of the brain).

FINDINGS BY COURCHESNE et al.: parietal defects were seen in 43% of autistic subjects.

COURCHESNE et al. believe the cerebellum plays a key role in shifting

the focus of mental attention. Their studies show that autistic children, like patients with cerebellar disorders, perform poorly on tests of attention-shifting ability.

In autism, Courchesne et al. suggest, "cerebellum maldevelopment [may] render the child unable to adjust his mental focus of attention to follow the rapidly changing verbal, gestural, postural, tactile and facial cues that signal changes in a stream of social information."

Some evidence indicates that the parietal defects also seen in many autistic individuals may cause difficulty in disengaging visuospatial attention.

Additional autistic symptoms, Courchesne et al. say, may result from the cerebellum's connections to, and coordination of activities by, other brain areas.

The researchers say evidence indicates that the cerebellar malformations seen in autism "must have an early developmental onset, perhaps as early as the second trimester" of pregnancy. The cause is unknown, but possible culprits include genetic defects, oxygen deprivation in utero or during birth, infections, metabolic disorders, and toxic exposure.