Biomedical Update:

What does the cerebellum do?

Many studies implicate defects of the cerebellum as a cause of autistic symptoms. But why would abnormalities of a brain area that controls *motor* functions be a cause of non-motor symptoms including attentional, language, and emotional problems? New research by Greg Allen, Eric Courchesne and colleagues may offer an answer.

The researchers note that "for more than a century, neurologists and neuroscientists alike have held the view that the singular function of the human cerebellum is to help coordinate movement." To test this theory, Allen et al. say, they planned an experiment designed to answer two questions: "First, is the cerebellum involved in cognitive operations that do not involve the motor system for learning, planning, or guiding movements? Second, if there is such cognitive cerebellar involvement, is it co-localized to the same region (or regions) involved in movement when movement is required, or is it localized to a separate region within the cerebellum?"

Using MRI scans, the researchers studied the cerebellar responses of six non-disabled volunteers under three conditions. In an "attention" task, the volunteers were shown different shapes and colors and asked to silently count a particular color/shape. This task, the researchers say, "required attention to visual stimuli in the absence of a motor response." In a "motor" task, subjects were asked to move their right hands repeatedly, without visual stimuli. The third task, in which subjects were asked to move their hands in response to certain colors/shapes, combined motor and visual attentional skills.

The researchers found that "in all subjects, the cerebellum was active during the attention task, which was performed in the absence of movement or motor planning." In addition, they found that attentional and motor tasks involved different regions of the cerebellum. This finding is important, they say, because "it shows that the cerebellum is not designed to perform a single neurobehavioral function, such as motor control or attention, but instead is a system composed of different regions that influence distinctly different neurobehavioral functions."

—

"Attentional activation of the cerebellum independent of motor involvement," Greg Allen, Richard B. Buxton, Eric C. Wong, and Eric Courchesne; *Science*, Vol. 275, March 28, 1997, pp. 1940-1943. Address: Eric Courchesne, Laboratory for the Neuroscience of Autism, Children's Hospital Research Center, La Jolla, CA 92037.

PROGRAM REFERRALS

THE AUTISM RESEARCH INSTITUTE maintains a list of schools and other services for autistic children and adults. If your school, group home, agency, or other service should be on this referral list, please send a stamped, self-addressed envelope (marked "resource list") to ARI, to receive our referral questionnaire. As a service to subscribers to this newsletter, we will provide, at no charge, a listing of the resources we know of for their state, and up to three neighboring states. The listing includes the information sent to us about their services by the groups themselves, and is not an endorsement or recommendation, since we do not have the resources to investigate the schools and services included.

SSRI drugs may cause behavior problems

D. W. Perry and colleagues report that two autistic patients developed severe behavior problems after being treated with SSRIs (selective serotonin reuptake inhibitors), a category of drugs that includes fluoxetine (Prozac), sertraline (Zoloft), fluvoxamine (Luvox), and paroxetine (Paxil).

Each of the patients had a history of depressive symptoms. "In both of our patients," Perry et al. report, "there was a rapid remission of depressive symptoms, followed by a period of normal mood. Next, three prominent behaviors emerged, namely, agitation, physical aggression, and sleep disturbance." In both cases, the drugs had to be stopped.

"We feel," Perry et al. conclude, "that antidepressants with a specific [serotonin-affecting] action may need to be used with more caution in pervasive developmental disorders than previously recognized."

—

"The use of specific serotonin re-uptake inhibitors in people with learning disability, autism and depression" (letter), D. W. Perry, S. Hinder, V. H. R. Krishnan, and A. Roy; *Human Psychopharmacology*, Vol. 11, 1996, pp. 425-426. Address: D. W. Perry, Brooklands, Coleshill Road, Marston Green, Birmingham B37 7HL, U.K.

Twin study: clues about role of genes in autism

A new study of twins indicates that genes play a role not just in "full blown" autism, but also in the development of similar but milder language and social deficits.

Ann Le Couteur and colleagues searched Britain for autistic individuals with twin siblings (either autistic or non-autistic), and located 28 pairs of monozygotic ("identical") twins, and 20 pairs of dizygotic ("fraternal") twins. The same-sex twin pairs included both adults recruited for an earlier study, and younger twins. The researchers found that:

—In 19 of the 28 pairs of identical twins, both twins had autism. In none of the 20 pairs of fraternal twins were both twins autistic.

—In seven of the identical twin pairs, one twin had autism and the other exhibited milder social and/or language deficits. Two of the fraternal twin siblings of autistic individuals exhibited such deficits.

"These findings," the researchers say, "indicate that the vast majority of monozygotic co-twins, and a much smaller proportion of the non-identical co-twins, had substantial difficulties in either social and/or cognitive functioning." These difficulties, Le Couteur et al. note, had affected the older mildly-affected subjects throughout their lives. "In spite of their normal non-verbal intelligence," the researchers say, "the individuals with [milder symptoms] lacked confiding relationships, were not living independently and tended to have employment difficulties."

Comparing symptoms within twin pairs to symptoms between pairs, the researchers were unable to find evidence of clinically distinct genetic subgroups of subjects. While such subgroups most likely exist, the researchers say, "our results show that it is likely that this will need to be detected by means other than variations in the clinical picture."

Le Couteur et al. say that data from their study and others (including a 1994 study by P. Bolton that found autistic-like symptoms in a high percentage of siblings of autistic children—see ARRI 9/1) "have made a strong case that a broader range of communication and social impairments should be included as part of the concept of autism."

—

"A broader phenotype of autism: the clinical spectrum in twins," Ann Le Couteur, Anthony Bailey, Susan Goode, Andrew Pickles, Sarah Robertson, Irving Gottesman, and Michael Rutter; *Journal of Child Psychology and Psychiatry*, Vol. 37, No. 7, 1996, pp. 785-801. Address: Ann Le Couteur, Academic Dept. of Child and Adol. Psychiatry, Fleming Nuffield Unit, Burdon Terrace, Jesmond, Newcastle Upon Tyne NE2 2AE, UK.