# Handicapped kids stand up to family stress

Researchers have long noted that children with physical disabilities stemming from brain disorders, such as cerebral palsy, also contend with more than their share of psychological disorders. According to one highly regarded theory, the brain disorders render these children more vulnerable to stress and conflict within their families, thus creating a greater risk of mental problems.

But a five-year study conducted by psychologist Naomi Breslau of the Henry Ford Hospital in Detroit finds more vulnerability in the theory itself than in the children it encompasses.

"Children with physical handicaps involving the brain are no more vulnerable to stress within the family than are healthy children," Breslau maintains.

The psychological difficulties that stand out among these youngsters are symptoms of depression related to social isolation and to other negative experiences confronting chronically ill or handicapped persons in general, Breslau reports in the January ARCHIVES OF GENERAL PSYCHIATRY. Handicapped children in the study also displayed substantial problems in maintaining concentrating, particularly in school. Symptoms of inattention may result directly from brain damage, Breslau asserts, but investigators have yet to establish this connection.

Breslau's study compares two groups of children: 157 youngsters with cerebral palsy, myelodysplasia (spinal cord defects) or multiple physical handicaps linked to a brain disorder, and 339 healthy children randomly selected from families living in Cleveland. Children and their mothers were interviewed separately in 1978 and again five years later, when the youngsters averaged 15 years of age.

Interviews with children focused on symptoms of psychological disturbance, such as depression, anxiety, persistent anger and aggression, inattention and hyperactivity. Mothers answered a "family cohesion" questionnaire gauging the amount of support and encouragement among family members.

Disabled children reported significantly more symptoms of depression and inattention than healthy controls, regardless of whether their family cohesion was strong or weak, Breslau says. However, in families providing low levels of support and encouragement, depression increased to the same degree among healthy youngsters as among handicapped ones.

"The physically handicapped children may have depressive reactions to the adversities posed by their condition," Breslau says. "But they do not necessarily have a psychiatric disorder." For example, handicapped children often reported signs of demoralization and sadness that Breslau had previously observed among children with cystic fibrosis, a disabling, life-shortening disease that does not involve the brain.

Inattention and difficulty in concentrating are not problems for cystic fibrosis patients, she adds. In her view, this suggests that these two symptoms may indeed have a biological root among children with brain-induced physical handicaps. *– B. Bower*

# Hints of another signaling system in brain

Astrocytes, the star-shaped cells that surround and support nerve cells in the brain and spinal cord, can propagate chemical waves over long distances in response to a chemical messenger found in the brain, researchers report. This intriguing discovery suggests that astrocytes, like nerve cells, may carry information between various parts of the central nervous system (CNS).

Astrocytes guide fetal neuron development, "digest" neurotransmitters and regulate the blood flow in the central nervous system. They belong to a class of cells called glia, which together outnumber nerve cells 10 to one in the brain and constitute about half the brain's volume. But until recently, says Bill Chiu, a neuroscientist at the University of Wisconsin-Madison, "people thought of glial cells as silent."

In the past few years this premise has begun to crumble, as researchers accumulated evidence that astrocyte surfaces bear receptors for glutamate, a common neurotransmitter in the brain. Experiments showed that these cells respond to glutamate by releasing stored calcium ions, but the function of the calcium releases remained unclear.

Ann H. Cornell-Bell, Steven M. Finkbeiner and their colleagues at the Yale University School of Medicine in New Haven, Conn., used a fluorescent calcium indicator to observe in unprecedented detail the dynamics of calcium release in cultured, glutamate-stimulated astrocytes. The astrocytes responded by unleashing waves of ions that spread like ripples inside the cells. Wave periods ranged from 9 seconds to 30 minutes depending upon the experimental conditions.

Other waves spread beyond the cells, triggering chemical ripples in nearby astrocytes. The longest wave initiated reactions in 59 other astrocytes in 51 seconds before leaving the microscope's field of view, the group reports in the Jan. 26 SCIENCE. "With receptors on these cells and a signaling system working between them, a potential communication system exists," Finkbeiner told SCIENCE NEWS.

Researchers have seen periodic release of calcium in many other types of cells, but the observation in astrocytes is "potentially very exciting," says Chiu, because astrocytes appear interconnected in the brain and often nestle near glutamate-secreting nerve junctions. "Now we can propose that glutamate activity in one part of the brain may be passed elsewhere [via astrocytes]," he says. "That adds a potential new dimension to signaling in the brain."

The Yale researchers do not yet know what kind of information the ionic pulses may encode. They hope to gain some clues by extending their experiments to slices of living brain tissue. *– R. Weiss*

## AMA policy on fetal tissue

Despite a moratorium on federal funding for human fetal tissue transplants, the American Medical Association (AMA) has issued ethical guidelines for researchers undertaking the experimental procedure with private funds. The guidelines strive to separate a woman's decision to have an abortion from her decision to donate fetal tissue for transplantation, says Russel Patterson Jr., who chaired one of two AMA councils drafting the policy.

The AMA bases its policy on human and animal studies indicating fetal tissue may eventually prove valuable in treating several medical disorders. Published in the Jan. 26 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, the guidelines prohibit: transplant-related financial gain for the donor or for those performing the abortion; donor designation of a tissue recipient; discussions of transplantation with a potential donor before she has made her final decision to have an abortion; and experimental use of the aborted tissue by those involved in aborting that fetus.

In 1988, a National Institutes of Health panel proposed similar safeguards, which NIH submitted to Health and Human Services Secretary Louis W. Sullivan. He instead extended an existing moratorium (SN: 11/11/89, p.310).

"The choice is throwing the tissue away or using it to benefit someone else," says Patterson, a neurosurgeon at Cornell University.

Attorney James Bopp Jr. of Terre Haute, Ind., an NIH panelist who formally dissented from the 1988 recommendations, disagrees: "If using fetal tissue becomes a successful therapy, it will be a widely known fact that it can be used to help others. Introducing a beneficent reason to have an abortion will cause some women to have an abortion who otherwise wouldn't." *– C. Decker*