Immune response abnormalities discovered

Tests performed on 31 autistic subjects have revealed immune system abnormalities, according to Utah researchers (Warren et al.).

The researchers studied the reaction of normal and autistic subjects' B and T lymphocytes—two types of white blood cells which help defend the body against attack by foreign substances— to three foreign substances which should have caused strong reactions. While the lymphocytes of the normal subjects responded actively to these substances, autistic subjects' lymphocytes showed "severely depressed responses."

The study also revealed that the autistic subjects had reduced numbers of T lymphocytes, and an abnormal ratio of helper T cells (which facilitate immune system responses) to suppressor T cells (which help "turn off" these responses).

Theories offered

The researchers say their findings are similar to those observed in a study of patients with manic depressive disorder. They offer several theories about the relationship of immune system dysfunction to autism:

- Immune system abnormalities may make the fetus more susceptible to viral infections, which have been linked to autism. Conversely, viral infections before birth may cause the immune defect.

- Thirty to 40 percent of autistic people have high levels of the neurotransmitter serotonin in their blood. A recent study suggests that lymphocytes exposed to high concentrations of serotonin have inhibited immune system responses. Therefore, the high blood serotonin levels of autistic individuals may suppress the immune response of lymphocytes.

- Autism has been linked to left-hemisphere brain dysfunction, and recent studies of mice indicate that left-sided brain lesions are associated with impaired T cell function. This, the researchers hypothesize, raises the possibility that "impaired T cell function in autistic individuals is a reflection of a brain lesion."

Killer cell activity reduced

In a second study, Warren et al. report that autistic children's natural killer (NK) cells—cells which appear to help protect against viral infections and malignancy—are less active than the NK cells of normal people.

NK cells apparently play a role in immune system regulation, because decreased NK cell activity is seen in several autoimmune disorders including lupus erythematosus, multiple sclerosis, rheumatoid arthritis, and Sjogren's syndrome.

Reduced NK cell activity was found only in 40% of Warren's autistic subjects, which he believes is "consistent with the theory that autism has more than one cause."

Anti-human antibodies found

Earlier evidence that autism may be an autoimmune disorder— a disorder which occurs when the body mistakes its own cells for foreign substances and attacks them—was found at Stanford by Richard Todd and Roland Ciaranello.

The researchers found that a nine-year-old autistic girl had antibodies in her blood against a binding protein present in serotonin receptor sites in brain cells. Later tests with 13 additional autistic children found that seven of them had similar antibodies to human serotonin receptors, while these antibodies were not seen in any of 13 normal children studied.

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"Immune Abnormalities in Patients with Autism," Reed P. Warren, Nadine C. Margaretten, Nancy C. Pace, and Ann Foster; *Journal of Autism and Developmental Disorders*, Vol. 16, No. 2, pp. 189- 197, 1986. Address: Reed P. Warren, UMC 68, Utah State University, Logan, Utah 84322.

—and—

"Reduced Natural Killer Cell Activity in Autism," Reed P. Warren, Nadine C. Margaretten, and Ann Foster; *Journal of the American Academy of Child and Adolescent Psychiatry*, Vol. 26, No. 3, 1987, pp. 333-335; address above.

—and—

"Demonstration of Inter- and Intra-Species Differences in Serotonin Binding Sites by Antibodies from an Autistic Child," Richard Todd and Roland Ciaranello; *Proceedings of the National Academy of Science USA*, Vol. 82, January 1985, pp. 612-616. Address: Richard Todd, Department of Psychiatry, Washington University School of Medicine, St. Louis, Missouri 63110. See also: "Pervasive Developmental Disorders and Immunological Tolerance," Richard Todd, *Psychiatric Developments*, Issue 2, 1986, pp.147-165; address above.

Prenatal immune system "attack" could damage fetus, cause autism

Autism may be caused before birth by a reaction of the mother's immune system to antigens the baby has inherited from the father, resulting in the production of antibodies which cause damage to the child.

Antigens are foreign substances which cause the body to produce antibodies to combat the antigen "invasion". In addition to viruses, bacteria, etc., antigens can be normal molecules in the tissues of one person's body which will cause an immune system reaction if they enter another person's body—as may happen if certain blood types are mixed.

Researchers (Stubbs et al.) have found that parents of autistic children are much more likely than the general population to have similar HLA antigens. (HLAs, or human leukocyte antigens, are located on the number six chromosome, and determine "histocompatibility" or the ability of the cells of one tissue to survive in the presence of cells of another tissue; these antigens must be similar, for instance, in order for transplants to succeed.)

While it might seem that similar parental antigens would lessen the chances that the mother's immune system would attack the paternal antigens in the fetus, the researchers speculate that differences—not similarities—of the HLA antigens stimulate the production of "blocking" antibodies which prevent maternal antibodies from attacking the fetus.

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"Autism and Shared Parental HLA Antigens," E. Gene Stubbs, Edward R. Ritvo, and Anne Mason-Brothers; *Journal of the American Academy of Child Psychiatry*, 24, 1985, 2:182-185. Address: E. Gene Stubbs, Child Development and Rehabilitation Center, P.O. Box 574, Portland, Oregon 97207.

Letters and notices

Letters to the editor are welcome. Letters intended for publication must be signed and should not exceed one page in length, including references. Letters may be edited without consulting the authors. Please do not submit letters which have also been submitted to other publications.

News and notices may be submitted for publication. Please submit news items and notices at least six weeks prior to publication.