MS LESION PROJECT INVESTIGATORS LINK RESPONSE TO THERAPY WITH PATTERN OF BRAIN LESIONS IN SOME PEOPLE WITH MS

An international team of investigators involved in the National MS Society-funded MS Lesion Project have published findings indicating that individuals with a specific pattern of tissue damage responded to plasma exchange therapy, a treatment used occasionally to treat individuals experiencing severe MS attacks that do not respond to standard steroid therapy. Claudia F. Lucchinetti, MD (Mayo Clinic and Foundation) and colleagues have published these findings in the August 13, 2005 issue of The Lancet (2005:365; 579-82).

Although the number (19) of patients studied was small, these are the first findings to support the premise that subtypes of MS may respond differently to therapies, based on the underlying characteristics of the immune attack. This premise is being explored through the MS Lesion Project, which is seeking to confirm these subtypes and to find ways of predicting which pattern of lesion damage a person has without doing invasive biopsies.

The MS Lesion Project is a targeted research initiative that has been supported by the National MS Society since 2000 to investigate the reasons for MS variability by studying lesions, areas where brain tissue shows signs of inflammation or damage. Understanding lesion patterns can provide more information about differences in disease between individuals, which will enable doctors to make more accurate diagnoses, prognoses, and treatment decisions.

Dr. Lucchinetti and collaborators from the U.S., Germany and Austria have amassed a large collection of tissue samples from people with MS – a painstaking effort, because these are obtained through brain biopsies (a rare procedure) or autopsy. Among more than 200 of these samples, the group has found four types of lesions, which differ in patterns of immune system activity. So far they have found that within each person, all lesions are the same, but
lesions differ from person to person. The researchers believe that this may be correlated with differences in disease type and prognosis, and perhaps with different responses to treatment.

Here they report on a retrospective analysis of samples from 19 people who had been treated with plasma exchange therapy and for whom they had brain tissue samples from brain biopsies or autopsies. These results were originally reported at the American Academy of Neurology’s annual meeting in 2002.

Plasma exchange therapy (plasmapheresis) is a process that involves removing whole blood from a person; removing and replacing the liquid portion or plasma from the blood; and transfusing the red and white blood cells back into the person. This process is a successful method for treating some autoimmune diseases such as myasthenia gravis and Guillain-Barre Syndrome, because it removes immune proteins known as antibodies that are thought to be responsible for these diseases. Because some plasma components – such as antibodies and other immune proteins known as complement – have been found in MS lesions, plasmapheresis has been tried as a treatment for severe MS that is unresponsive to other standard therapies. It has not been clear how beneficial plasma exchange is in the short- or long-term treatment of MS, and its use in MS has remained controversial.

The review of samples from 19 individuals revealed that all 10 individuals with lesion pattern II experienced moderate to substantial improvements in neurological function following plasma exchange therapy. Dr. Lucchinetti’s team has characterized lesion pattern II as showing disease activity involving antibodies and complement. None of the 9 individuals with other lesion patterns showed improvement.

These findings indicate the potential of the MS Lesion Project to help clinicians tailor therapies for individual patients. However, more research is ongoing to find less invasive ways than brain biopsy for identifying lesion patterns. Dr. Lucchinetti and colleagues are thus looking for “markers” that may correlate with lesion patterns that can be identified using blood tests or imaging scans. This crucial effort is increasing our understanding of the development of MS and is presenting exciting possibilities for the future of MS treatment and care.

The MS Lesion Project was supported for the first five years by the Society’s Research Challenge of Champions, and is now part of the Society’s Promise 2010 Campaign, which aims to raise at least $30 million for this and other important targeted MS research.

-- Research & Clinical Programs Department