Scientists identify 2 genes as potential therapeutic targets for multiple sclerosis

11 September 2009

A Mayo Clinic study has found that two genes in mice were associated with good central nervous system repair in multiple sclerosis (MS). These findings give researchers new hope for developing more effective therapies for patients with MS and for predicting MS patients' outcomes. This study will be presented at the Congress of the European Committee for Treatment and Research in Multiple Sclerosis in Dusseldorf, Germany, on Sept. 11, 2009.

"Most MS genetic studies have looked at disease susceptibility -- or why some people get MS and others do not," says Allan Bieber, Ph.D., a Mayo Clinic neuroscientist and author of this study. "This study asked, among those who have MS, why do some do well with the disease while others do poorly, and what might be the genetic determinants of this difference in outcome."

Mayo Clinic provides care for nearly 2,500 patients with MS each year. MS is a disease of the central nervous system that includes the brain, spinal cord and nerves. MS is called a demyelinating disease because it results from damage to myelin, the insulating covering of nerves. It occurs most commonly in those between the ages of 20 and 40, and is the most frequent neurological disorder in young adults in North America and Europe. Approximately 330,000 people in the United States have MS. Symptoms include loss of muscle coordination, strength, vision, balance and cognition.

Dr. Bieber and a team of Mayo Clinic researchers used two different strains of mice with a chronic, progressive MS-like disease. One strain progressed to paralysis and death. The other underwent the initial damage induction phase of the disease and then spontaneously repaired the damage to the central nervous system and retained most neurologic function. Using the powerful genetic mapping techniques that are available for mice, the team mapped two strong genetic determinants of good disease outcome.

"It's possible that the identification of these genes may provide the first important clue as to why some patients with MS do well, while others do not," says Dr. Bieber. "The genetic data indicates that good central nervous system repair results from stimulation of one genetic pathway and inhibition of another genetic pathway. While we're still in the early stages of this research, it could eventually lead to the development of useful therapies that stimulate or inhibit these genetic pathways in patients with MS."

According to Dr. Bieber, the research suggests that there may be a small number of strong genetic determinants for central nervous system repair following demyelinating disease, rather than a larger number of weak determinants.

"If that's true, it may be possible to map the most important genetic determinants of central nervous system repair in patients with MS and define a reparative genotype that could predict patients' outcomes," says Moses Rodriguez, M.D., a Mayo Clinic neurologist and director of Mayo Clinic's Center for Multiple Sclerosis and Central Nervous System Demyelinating Diseases Research and Therapeutics. "Such a diagnostic tool would be a great benefit to patients with MS and is consistent with the concepts of 'individualized medicine.'"

Source: Mayo Clinic (news : web)