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Dose of Own Stem Cells Reverses Patients' Multiple Sclerosis

By: ROB WATERS

(Bloomberg) -- A dose of their own stem cells "reset" the malfunctioning immune system of patients with early-stage multiple sclerosis and, for the first time, reversed their disability, according to researchers at Northwestern University in Chicago.

All 21 patients in the study had the "relapsing-remitting" form of the disease that makes their symptoms alternately flare up and recede. Three years after being treated, on average, 17 of the patients had improved on tests of their symptoms, 16 had experienced no relapse and none had deteriorated, the study found.

"This is the first study to actually show reversal of disability," said Richard Burt, an associate professor in the division of immunotherapy at Northwestern, and the lead author of the study published yesterday in the British journal, the Lancet Neurology. "Some people had complete disappearance of all symptoms."

Researchers are using stem cells taken from people's own bodies to try to fight conditions such as heart disease, orthopedic ailments and to reconstruct women's breasts after cancer surgery. These adult stem cells differ from those derived from embryos, which have the potential to form any of the roughly 210 cell types in the human body. Geron Corp. last week was given U.S. regulatory approval to conduct the first human studies with embryonic stem cells.

In multiple sclerosis, or MS, a patient's immune cells attack the central nervous system, degrading their vision, coordination, balance and sometimes their cognitive abilities.

Drug Treatment

The vast majority of patients with this disease are first diagnosed with the relapsing-remitting form and some progress to more serious stages. The study included only patients whose flare-ups continued after being treated with protein-based drugs known as interferons.

Participants had their hematopoietic, or blood-forming, stem cells extracted before chemotherapy drugs killed immune cells in their bone marrow. The patients' stem cells were then returned to rebuild their marrow.

One of the patients was Edwin McClure, now a 24-year-old graduate student in marketing at Virginia Commonwealth University in Richmond. McClure was diagnosed with multiple sclerosis as a high school senior in 2002, after his vision dramatically worsened.

“It was like someone had turned down the dimmer switch,” he said in a Jan. 28 telephone interview. He also suffered from dizziness, poor balance and fatigue so bad that he’d collapse and sleep for three hours every day after school.

Over the next few years, McClure was treated with steroids and interferons. While they controlled the disease for a time, his symptoms eventually broke through, triggering fresh attacks.

McClure went to Chicago to take part in Burt’s study at the end of 2005, spent a month being treated, and hasn’t needed any drugs since.

‘A Blessing’

“It’s a blessing,” he said. “My disease has been halted.”

Even the stress of being in the competitive graduate program -- a factor known to exacerbate symptoms of multiple sclerosis -- hasn’t caused a single attack, he said. His balance is better and his vision hasn’t deteriorated further.

MS affects an estimated 400,000 Americans and 2.5 million people worldwide. Researchers believe that in the early stage of the disease, the hyperactive immune cells attack nerve cells. This damages the myelin, an insulating material that surrounds the axons, long fiber tails that extend from a neuron and help transmit electrical signals.

Early Effort

“Research has shown it’s critical to stop the inflammation early and that’s probably the best way to stop neural degeneration and progression of the disease,” said Patricia O’Looney, vice president of biomedical research at the National MS Society, in a Jan. 28 telephone interview.

In previous efforts, Burt and other scientists tried giving bone marrow stem cells to patients with more advanced disease, with no benefit.

“I called it a failure,” he said. “When you do it in late-stage patients, they don’t improve,” probably because the immune cells have already done their damage.

O’Looney said the results of Burt’s study were promising and should now be replicated in a larger trial that randomly compares the stem-cell treatment with existing therapy. Burt is now starting such a trial, which will recruit 55 patients in the U.S., Canada and Brazil.

If the results of today’s study are borne out in the new one, “I think we can really change the way this disease is approached,” Burt said.