MedicalXpress

Preferable treatment for MS found in allogenic bone marrow stem cells

December 18 2013

Multiple sclerosis (MS), an inflammatory autoimmune disease affecting more than one million people worldwide, is caused by an immune reaction to myelin proteins, the proteins that help form the myelin insulating substance around nerves. Demyelination and MS are a consequence of this immune reaction. Bone marrow mesenchymal stem cells (MSCs) have been considered as an important source for cell therapy for autoimmune diseases such as MS because of their immunosuppressive properties.

Now, a research team in Brazil has compared MSCs isolated from MS patients and from healthy donors to determine if the MSCs from MS patients are normal or defective. The study will be published in a future issue of *Cell Transplantation* but is currently freely available on-line as an unedited early e-pub.

"The ability of MSCs to modulate the immune response suggests a possible role of these cells in tolerance induction in patients with autoimmune diseases, and also supports the rationale for MSC application in the treatment of MS," said study corresponding author Dr. Gislane Lelis Vilela de Oliveira of the Center for Cell-Based Research at the University of Sao Paulo. "We found that MS patient-derived MSCs present higher senescence, or biological aging, and decreased expression of important immune system markers as well as a different transcriptional profile when compared to their healthy counterparts."

The researchers suggested that further clinical studies should be

conducted using transplanted allogenic (other-donated) MSCs derived from healthy donors to determine if the MSCs have a therapeutic effect over transplanted autologous (self-donated) MSCs from patients.

"Several reports have shown that bone marrow-derived MSCs are able to modulate innate and adaptive immunity cell responses and induce tolerance, thus supporting the rationale for their application in treating autoimmune diseases, " said the researchers.

They also noted that studies have shown that transplanted MSCs migrate to demyelinated areas as well as induce generation and expansion of regulatory T cells, important in immunity.

"We found that the transcriptional profile of patient MSCs after transplantation was closer to that of their pre-transplant MSC samples than those from their healthy counterparts, suggesting that treatment with patient self-donated MSCs does not reverse the alterations we observed in MSCs from MS patients," they concluded.

The researchers further noted that their results might not be representative of "typical" MS patients because their study included only patients who were refractory to conventional treatments.

"This study highlights one of the potential problems with autologous stem cell transplants" said Dr. Paul R. Sanberg, distinguished professor at the Center of Excellence for Aging and Brain Repair, Morsani College of Medicine, University of South Florida, Tampa, FL. "Autologous cells are frequently affected by the disease etiology thus reducing their ability to be effective, meaning that allogenic transplants maybe preferable to maximize their potential benefit if other concerns such as rejection can be overcome."

More information: de Oliveira, G. L. V.; de Lima, K. W. A.;

Colombini, A. M.; Pinheiro, D. G.; Panepucci, R. A.; Palma, P. V. B.; Brum, D. G.; Covas, D. T.; Simões, B. P.; de Oliveira, M. C.; Donadi, E. A.; Malmegrim, K. C. R. Bone marrow mesenchymal stromal cells isolated from multiple sclerosis patients have distinct gene expression profile and decreased suppressive function compared with healthy counterparts. *Cell Transplant.* Appeared or available online: November 20, 2013