Third-party blood stem cell transplantation as a factor to impact on poor graft function

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When a research team in China evaluated the efficacy and safety of using mesenchymal stem cells (MSCs) expanded from the bone marrow of non-self-donors to treat patients experiencing poor graft function (PGF) after receiving transplants of non-self-donated blood stem cells (allo-HSCT), they found that the mesenchymal stem cells were both safe and effective for treating primary and secondary PGF.

The study appears as an early e-publication for the journal *Cell Transplantation*, and is now freely available on-line at http://www.ingentaconnect.com/content/cog/ct/pre-prints/ct0832liu.

"Allogenic hematopoietic stem cell transplantation can cure many hematologic diseases," said study co-author Dr. Qifa Liu of the Southern Medical University in Guangzhou, China. "However, poor graft function is a complication that occurs in five to 27 percent of patients receiving allo-HSCT and is associated with considerable morbidity and mortality."

According to the researchers, graft function may be poor after allogenic hematopoietic stem cell transplantation because of slow or incomplete reconstitution of blood counts or decreasing blood counts. PGF, which is poorly understood, is a potentially life-threating condition when it leads to graft vs. host disease (GVHD).

In this study, when 20 patients demonstrated risk factors for PGF, researchers infused them with MSCs derived from bone marrow from third-party donors. PGF had developed in five patients with acute

GVHD and two patients had chronic GVHD.

"The patients receiving the MSCs achieved either complete responses or improved GVHD," said the researchers. "However, the PGF did not improve when immunosuppressive agents were given. This means that additional studies will be needed to determine whether PGF is associated with immunologic factors."

One unanswered question, said the researchers, was whether the immunosuppressive properties of MSCs are an important factor that could have a favorable impact on potential problems such as an increased risk of infection or tumor relapse following cell transplantation.

"Although six of 20 patients died from infections within the first 100 days of MSC transplantation, we could not safely conclude that MSCs increased the incidence of infections other than Epstein-Barr," they wrote.

In conclusion, the researchers noted that "clinical applications of human MSCs are evolving rapidly with goals of improving hematopoietic engraftment and preventing GVHD after allogenic hematopoietic stem cell transplantation."

"This study highlights the potential impact of allogeneic mesenchymal stem cell transplants as an adjunctive therapy for hematopoietic stem cell transplantation to reduce the likelihood of the patient developing graft versus host disease after exhibiting risk factors for poor functioning of the grafted cells" said Dr. Paul R. Sanberg, distinguished professor at the Center of Excellence for Aging and Brain Repair, University of South Florida.

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Xiaoyong Chen, Jing Sun, Fen Huang, Zhiping Fan, Hongsheng Zhou, Xiuli Wu, Guopan Yu, Xian Zhang, Yonghua Li, Yang Xiao, Chaoyang Song, Andy Peng Xiang, Qifa Liu. Improvement in Poor Graft Function after Allogeneic Hematopoietic Stem Cell Transplantation upon Administration of Mesenchymal Stem Cells from Third-Party Donors: A Pilot Prospective Study. Cell Transplant. Appeared or available online: January 2, 2013.

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