Use of stem cells for adults receiving related donor kidney transplants appears to improve outcomes

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Among patients with end-stage renal disease undergoing living-related kidney transplants, the use of bone-marrow derived mesenchymal (cells that can differentiate into a variety of cell types) stem cells instead of antibody induction therapy resulted in a lower incidence of acute rejection, decreased risk of opportunistic infection, and better estimated kidney function at 1 year, according to a study in the March 21 issue of *JAMA*.

Induction therapy, routinely implemented in organ transplant procedures, consists of use of biologic agents to block early immune activation. New induction immunosuppressive protocols with increased efficacy and minimal adverse effects are desirable. "Antibody-based induction therapy plus calcineurin inhibitors (CNIs) reduce acute rejection rates in kidney recipients; however, opportunistic infections and toxic CNI effects remain challenging. Reportedly, mesenchymal stem cells (MSCs) have successfully treated graft-vs.-host disease," according to background information in the article.

Jianming Tan, M.D., Ph.D., of Xiamen University, Fuzhou, China and colleagues examined the effect of autologous (derived from the same individual) MSC infusion as an alternative to anti-IL-2 receptor antibody for induction therapy in adults undergoing living-related donor kidney transplants. The randomized study included 159 patients. Patients were inoculated with marrow-derived autologous MSC at kidney reperfusion

and two weeks later. Fifty-three patients received standard-dose and 52 patients received low-dose CNIs (80 percent of standard); 51 patients in the control group received anti-IL-2 receptor antibody plus standard-dose CNIs.

Patient and graft survival at 13 to 30 months was similar in all groups. The researchers found that after 6 months, 4 of 53 patients (7.5 percent) in the autologous MSC plus standard-dose CNI group and 4 of 52 patients (7.7 percent) in the low-dose group compared with 11 of 51 controls (21.6 percent) had biopsy-confirmed acute rejection. Renal function recovered faster among both MSC groups showing increased estimated glomerular filtration rate (eGFR; a measure of kidney function) levels during the first month after surgery than the control group.

The authors also found that during the 1-year follow-up, combined analysis of MSC-treated groups revealed significantly decreased risk of opportunistic infections than the control group.

"In our prospective randomized trial on a large patient population, autologous MSCs could replace anti-IL-2 receptor-induction therapy in living-related donor kidney transplants. Recipients of autologous MSCs showed lower frequency of biopsy-confirmed acute rejection in the first 6 months than the control group," the researchers write.

"Extended monitoring of study participants will allow assessment of the long-term effects of autologous MSCs on renal allograft function, survival, and safety."

More information: JAMA. 2012;307[11]:1169-1177.

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