Ready-to-use T cells for infection after stem-cell transplant

A new phase 2 trial suggests that cryopreserved virus-specific T cells (VSTs) prepared from third-party donors are a safe and effective treatment for recipients of allogeneic hematopoietic stem cell transplantation (allo-HSCT) who develop drug-refractory viral infections. Viral infection is a common, life-threatening complication for these patients, and drug treatment can be ineffective or have substantial side-effects.

In the study by Ifigeneia Tzannou (Baylor College of Medicine, Houston TX, USA) and colleagues, 38 patients with severe viral infections after allo-HSCT received an infusion of partially HLA-matched VSTs (2×10^7 cells per m^2) from healthy, seropositive donors targeting either one viral infection (n=31) or two (n=7). 18 patients in the study received no infusion. 6 weeks after a single VST infusion, complete or partial responses were observed in 91·9% (95% CI 78·1–98·3) of 37 evaluable treated patients, including two (100%) of two patients with a response to Epstein-Barr virus, 16 (100%) of 16 with a response to BK virus, 16 (94%) of 17 with a response to cytomegalovirus, five (71%) of seven with a response to adenovirus, and two (67%) of three with a response to human herpesvirus 6. By comparison, 12 (67%) of 18 patients who did not receive VST therapy developed progressive disease. Infusions were well tolerated; one patient developed recurrent grade 3 graft-versus-host disease (GVHD) and five patients developed recurrent or de novo grade 1–2 skin GVHD.

Co-author Bilal Omer summarized, "We extended the off-the-shelf approach to up to five viruses in one infusion. A lot of stem cell transplant patients do have multiple virus infections, and there is an advantage to using a single infusion." Most exciting to Omer were the BK virus results. "BK virus causes hemorrhagic cystitis leading to severe bleeding and pain. In some cases, there were dramatic results—the patients improved in a few days."

Filippo Milano (Fred Hutchinson Cancer Research Center, Seattle, WA, USA) commented, "The innovation in this study is that the investigators are making an off-the-shelf product they can use against any virus any time, available for any patient undergoing an allogeneic transplant." Simrit Parmar (MD Anderson Cancer Center, Houston, TX, USA) said, "These results generate optimism, and provide a viable treatment option for patients suffering from drug-therapy resistant severe viral infections after receiving allo-HSCT."

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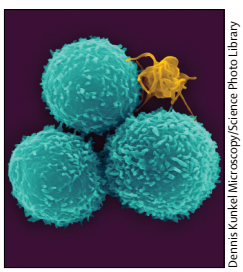

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For the study by **Tzannou and colleagues** see *J Clin Oncol* 2017; published online Aug 7. https://dx.doi.org/10.1200/JCO.2017.73.0655