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Title:
Allogeneic bone marrow transplantation in two HIV-1 infected patients shows no detectable HIV-1 RNA or DNA, and a profound reduction in HIV-1 antibodies.

Background:
Allogeneic bone marrow transplantation (BMT) can have significant effects on viral reservoirs in HIV-1 infected individuals, and in one case led to an apparent sterilising cure.

Methods:
We studied two HIV-1 infected patients who had undergone allogeneic BMT with reduced intensity conditioning (RIC) for haematologic malignancies. HIV-1 antigens and antibodies (Ag/Ab) were measured by 4th generation chemiluminescence microparticle immunoassay (CMIA) and by Western blot (WB). HIV-1 specific CD4+ T cell responses were measured by CD25/CD134 upregulation. HIV-1 RNA levels in plasma were measured by two separate real-time PCR assays with 20 as well as single copy/ml sensitivity; HIV-1 DNA levels were assessed in peripheral blood mononuclear cells (PBMCs) as well as in isolated CD4+ T cells by PCR using three different primer sets. Both patients were tested for the presence of the CCR5Δ32 mutation by PCR.

Results: Two subjects (A and B) received HLA matched, allogeneic stem cell transplants in 2010 (A) and 2011 (B) for non-Hodgkin's lymphoma and acute myeloid leukaemia respectively. Both patients remained on antiretroviral therapy during and following the procedure. Post-transplant, subject A experienced systemic grade 2 graft versus host disease (GVHD), whereas subject B developed only mild, skin related GVHD. Patient A was heterozygous for the CCR5Δ32 mutation post-transplant, patient B was CCR5 wildtype. Following BMT both patients had no detectable HIV-1 RNA in plasma by either real-time PCR assay, and no detectable HIV-1 DNA by PCR in PBMCs or CD4+ T cells. CD4+ T cell responses to HIV-1 antigen were absent in both patients. Ag/Abs to HIV-1 were detectable by CMIA and WB in both patients prior to BMT. Post-transplant, both patients had low level detectable Ag/Abs on CMIA, but by WB there was only trace antibody detectability in patient A and absent antibodies in patient B.

Conclusion: Assessment of the HIV-1 reservoir size in these two patients after allogeneic BMT with RIC shows undetectable HIV-1 RNA and DNA in peripheral blood and absent CD4+ T cell responses to HIV-1 antigen. We also found a profound reduction in Ab detectability in both patients by WB.