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Renal Transplantation between HIV-Positive Donors and Recipients

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To the Editor

Nephropathy associated with infection with the human immunodeficiency virus (HIV) is the leading cause of end-stage renal disease (ESRD) in HIV-infected patients in South Africa.[1,2] We practice in a resource-constrained environment where the use of dialysis is limited; as a result, many patients for whom dialysis would be appropriate are sent home to die. Decreasing availability of transplants from deceased donors and an increasing frequency of HIV infection among brain-dead donors compound the problem. Recent studies suggest that the outcome of renal transplantation is similar in HIV-infected and noninfected recipients when HIV-negative donor kidneys are used.[3] However, the safety and effectiveness of transplanting a kidney from an HIV-positive donor into an HIV-infected recipient is undetermined.

At our hospital, we undertook four renal transplantations involving HIV-positive recipients and HIV-positive donors, from September through November 2008 (Table 1). The recipients had ESRD, were receiving antiretroviral therapy, had stable disease (defined as an HIV viral load of <50 copies per milliliter for >6 months), and had no previous opportunistic infections other than fully treated pulmonary tuberculosis (Patient 2). None had access to dialysis or an HIV-negative donor transplant within the state sector, because HIV was an exclusion criterion. The four transplants were from two deceased donors who had not received antiretroviral therapy, did not have a history of serious opportunistic infection or cancer, and had normal renal biopsies without evidence of proteinuria.

Recipients received antithymocyte globulin as induction therapy, prednisone, mycophenolate mofetil, and tacrolimus. One patient receiving tacrolimus had calcineurin toxicity and was switched to sirolimus. At 12 months after transplantation, all patients had good renal function, did not have clinically significant graft rejection, and have not needed dialysis since the procedure.

Transplantation programs in resource-limited settings cannot offer renal replacement to all patients who are in need. The use of HIV-infected donors would increase the donor pool, providing organs that otherwise would be discarded to recipients who would otherwise die of ESRD. The suitability of recipients depends on therapeutic, physical, and social attributes.

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All recipients must have proven adherence, virologic suppression, and immune reconstitution. Donor suitability is defined as HIV infection (confirmed with the use of enzyme-linked immunosorbent assay), absence of proteinuria, and a normal kidney as assessed with post hoc renal biopsy. To combat high rates of early acute rejection, antithymocyte globulin should be used. Prospective studies are needed to assess viral characteristics in donor–recipient pairs as factors for graft failure and disease progression.

We do not underestimate the potential for accelerating HIV disease progression by superinfecting the recipient with a different HIV clade or recombinant virus.[4] Currently, HIV resistance rates are low in South Africa, and the use of antiretroviral therapy based on a boosted protease inhibitor in all recipients would increase the likelihood of suppressing any virus that is transplanted along with the kidney.

This report of four successful renal transplantations involving HIV-positive donors and recipients offers a new therapeutic approach to treating selected HIV-infected patients who have ESRD.

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Table 1

Clinical Characteristics of HIV-Positive Recipients of a Transplant from an HIV-Positive Donor.*

Characteristic	Patient 1	Patient 2	Patient 3	Patient 4
Age (yr)	47	56	37	29
Sex	Male	Male	Male	Female
Before transplantation				
Diagnosis on renal biopsy	HIV-associated nephropathy	HIV-associated nephropathy and hypertensive nephropathy	Malignant hypertension	HIV-associated nephropathy
Creatinine (μmol/liter)	678	582	1712	725
CD4 count (cells/mm^3)	288	258	132	147
HIV viral load (copies/ml)	<50	<50	<50	<50
Antiretroviral regimen	Tenofovir, lamivudine, and lopinavir–ritonavir	Stavudine, lamivudine, and efavirenz	Stavudine, lamivudine, and nevirapine	Zidovudine, lamivudine, and nevirapine
After transplantation				
Antiretroviral regimen	Tenofovir, lamivudine, and lopinavir–ritonavir	Tenofovir, lamivudine, and lopinavir–ritonavir	Tenofovir, lamivudine, and lopinavir–ritonavir	Tenofovir, lamivudine, and lopinavir–ritonavir
CD4 count (cells/mm^3)				
At 6 mo	129	113	140	140
At 12 mo	253	119	112	220
HIV viral load (copies/ml)				
At 6 mo	<50	<50	<50	<50
At 12 mo	<50	<50	<50	<50
Creatinine (μmol/liter)				
At 6 mo	114	119	181	101
At 12 mo	87	104	110	85
Diagnosis on renal biopsy				
At 3 mo	Normal kidney	Normal kidney	Acute tubular necrosis	Normal kidney
At 9 mo	Normal kidney	Calcineurin toxicity	Early collapsing glomerulonephritis	Normal kidney
Tacrolimus				
Average dose (mg/wk)	1.00	1.25	0.75	0.50
Average trough level at 0–12 mo (ng/ml)	12.10	11.86	7.50	11.85

* To convert values for creatinine to milligrams per deciliter, divide by 88.4. HIV denotes human immunodeficiency virus.