

Organ Trafficking for Live Donor Kidney Transplantation in Indoasians Resident in the West Midlands: High Activity and Poor Outcomes

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Introduction. Some Indoasian (IA) patients with established renal failure travel abroad for commercial kidney transplantation. We compared the 1-year outcomes of IA patients from one UK region who received overseas transplants with IA patients receiving local living donor (LD) kidney transplantation, deceased donor (DD) transplantation, and dialysis.

Methods. Between 1996 and 2006, 40 adults were transplanted overseas; 38 were IA, and follow-up data were available on 36 patients. Forty IA patients received LD transplants, and 156 patients received DD transplants locally. A cohort of 120 prospective dialysis patients was also used as a comparator group.

Results. In the overseas cohort, 20 patients (56%) were not active in the UK transplant waiting list at the time of kidney transplantation overseas. One-year graft survival was 87%, and 1-year patient survival was 83%. Composite graft and patient survival was 69.5% at 1 year. In the local LD transplant recipients, patient survival was 97.5% (39 of 40; $P=0.03$), and graft survival was 97.5% (39 of 40; $P=0.06$). Composite graft and patient survival was 95% ($P=0.003$). In the overseas group, 42% had major infections compared with 15% in the local group ($P=0.02$). One-year graft survival for DD transplant was 84.6% (132 of 156), and 1-year patient survival was 93% (145 of 156; $P=NS$ and $P=0.06$, respectively). In the dialysis group, 1-year patient survival was 96.7% (116 of 120; $P=0.001$).

Conclusion. IA patients who choose to travel overseas for kidney transplantation have poor clinical outcomes and should be counseled accordingly.

Keywords: Overseas, Kidney transplantation, outcomes

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For many people with established renal failure (ERF; or end-stage renal disease), the best long-term treatment is kidney transplantation (1). The best outcomes are seen in recipients of kidneys from living donors (LD) (2); LD transplantation now represents approximately 35% of all kidney transplantation in the United Kingdom (3).

In the people of Indoasian (IA) ethnicity in the United Kingdom, the incidence of ERF is three to five times higher than whites (4); however, kidney transplant rates are low. For example, in the West Midlands, a region with a population of 5.4 million people where 8.2% of people with ERF are IA, members of this group wait on the deceased donor (DD) list

for 57 months (median) before receiving a transplant compared with 30 months for whites (5). Furthermore, although IAs comprise approximately 25% of the transplant waiting list in the region, only 8% of all LD transplants in the West Midlands are in this group; this is despite focused efforts to increase LD rates from families and friends (6).

Anecdotal evidence suggests that some IAs with ERF who live in the United Kingdom are traveling overseas for LD (commercial) transplantation (7). This practice is also known as transplant tourism (8), is regarded as unethical by mainstream opinion (9), and is illegal in many countries where it

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occurs. Furthermore, the outcomes of transplant tourists returning to the United Kingdom are not known.

The objective of this study was to assess the contribution of transplant tourism to LD kidney transplantation in IAs with ERF resident in the West Midlands. For the 10 yr period up to March 2006 we report overall transplant activity and compare one-year outcomes for patient and graft survival and incident viral infections between overseas and local LD transplants. We also compare the outcomes with IA patients who received local DD transplant and with those who were on dialysis, during the same time period.

METHODS

The West Midlands Regional renal network comprises six clinical units that provide all care for adult patients with ERF who live in the West Midlands. From April 1996 to March 2006, a transplant clinician from each unit analyzed the records from dialysis programs and transplant follow-up clinics to identify all patients with ERF and known to NHS renal services who had traveled abroad for kidney transplantation. All the kidneys that were transplanted were reported by the recipients or their family members. Patients who received a LD kidney elsewhere, but were not resident in the region before receiving a transplant, were not included in the analysis.

A second group comprising all LD kidney transplantation performed in the West Midlands into recipients of IA ethnicity was used as a comparator group. This represented the local standard of care for LD kidney transplantation for the same period. There were two other comparator groups; IA patients from West Midlands who either received DD kidney locally or were on dialysis during the same period.

Demographic data were derived from hospital databases. Clinical data were obtained from clinical databases and hospital records. These included the provision of assessment for transplantation; time on the UK waiting list before travel for transplantation; and time on dialysis pretransplantation. After transplantation 1-year outcomes were collected for patient survival, graft survival, and incidence of new major viral infections: cytomegalovirus (CMV) infection, hepatitis B infection, and hepatitis C infection. Outcome data for the local LD cohort and for those who received DD transplants were obtained from UK transplant databases, which comprise a prospective dataset from the time of transplantation, updated quarterly for graft and patient survival.

To compare the outcomes of overseas LD recipients with local incident IA dialysis patients, data were used from a prospective dialysis cohort that comprised consecutive patients starting dialysis and censored for transplantation between 1996 and 2000. These patients commenced dialysis in the catchment areas of four of the renal units who participated in this study. The results of this cohort have been reported recently in detail elsewhere (10).

RESULTS

Forty patients received LD transplants overseas; 38 of these were of IA ethnicity, one was Chinese, and the other was white. Three IA patients received two overseas transplants during the time period. Two patients were lost to follow-up. Therefore, 1-year outcomes from 36 IA patients (39 transplant episodes) were analyzed. Of these 25 were men and 11 were women. The median age of the patients was 51.5 years (range 28–87 years). Nine patients (24%) were diabetic. There were 37 transplant episodes from unrelated LDs and two from deceased donors.

In the local group, 40 IA patients received LD transplants in the same period; 25 men, 15 women. Eight patients (20%) were diabetic. The median age of the patients was 40 years (range 16–61 years). They all received first grafts from live donors, of which 26 were from blood relatives. The demographic and clinical data for both groups are shown in Table 1.

TABLE 1. Characteristics and results of IA patients transplanted abroad

	Overseas Tx	Local Tx
Age (yr), median (range)	51.5 (28–87)	40 (16–62)
Sex	11 F, 25 M	15 F, 25 M (<i>P</i> =NS)
Diabetes	9/36 (25%) 1 not known	8/40 (20%)
On Tx waiting list	16/36 (44%)	40 (100%)
Post-Tx CMV	6/36 (17%)	6/40 (15%)
Post-Tx hepatitis B	4/36 (11%)	0
Post-Tx hepatitis C	5/36 (14%)	0
Patient survival (1 yr)	30/36 (83%)	39/40 (97.5%)
Graft survival (1 yr)	34/39 (87%)	39/40 (97.5%)

Tx, transplantation; CMV, cytomegalovirus; IA, Indoasian.

TABLE 2. Characteristics and results of IA patients who received DD transplant or dialysis treatment in United Kingdom

	Deceased donor Tx	Dialysis
Age (yr), median (range)	47 (18–70)	Median 40 (16–62)
Diabetes	4/156 (2.6%)	48/120 (40%)
Patient survival (1 yr)	145/156 (93%)	116/120 (96.7%)
Graft survival (1 yr)	132/156 (84.6%)	

Tx, transplantation; IA, Indoasian; DD, deceased donor.

There were 156 local IA DD kidney transplant in the same period. The median age was 47 years (range 18–70 years). Four patients received second grafts. Diabetes was documented as the cause of renal failure in four patients (2.6%), but the overall incidence of diabetes at the time of transplantation was not known.

The dialysis group consisted of 120 IA patients. The median age was 40 years (range 16–62 years). There were 76 men and 44 women (ratio 1.7:1). Forty eight patients were diabetic (40%). Forty-five patients received peritoneal dialysis, and 75 patients received hemodialysis. The data are summarized in Table 2.

All the patients who traveled overseas for transplantation had been assessed previously for the waiting list for kidney transplantation in the United Kingdom. Twenty patients (56%) were not placed on the waiting list at the time of transplantation. Of the 20 patients, six patients were not considered fit for transplantation; four of them had moderate to severe ischemic heart disease, one was overweight, and one was noncompliant. Of the remaining 14 patients, six were being worked up, four had a transplant before moving into our region, three did not want to be waitlisted for a DD, and in one, the reason is not known. Sixteen patients (44%) were active on the UK transplant waiting list at the time of travel. Seven (20%) had been active on the waiting list for more than 2 years.

Information on the induction immunosuppression regimen (including induction antibodies) used for the overseas group was not available on the large majority of patients. The immunosuppressive drug combination that patients

COMPARISON OF 1 YEAR PATIENT SURVIVAL BETWEEN INDO-ASIAN PATIENTS TRANSPLANTED IN THE U.K AND ABROAD

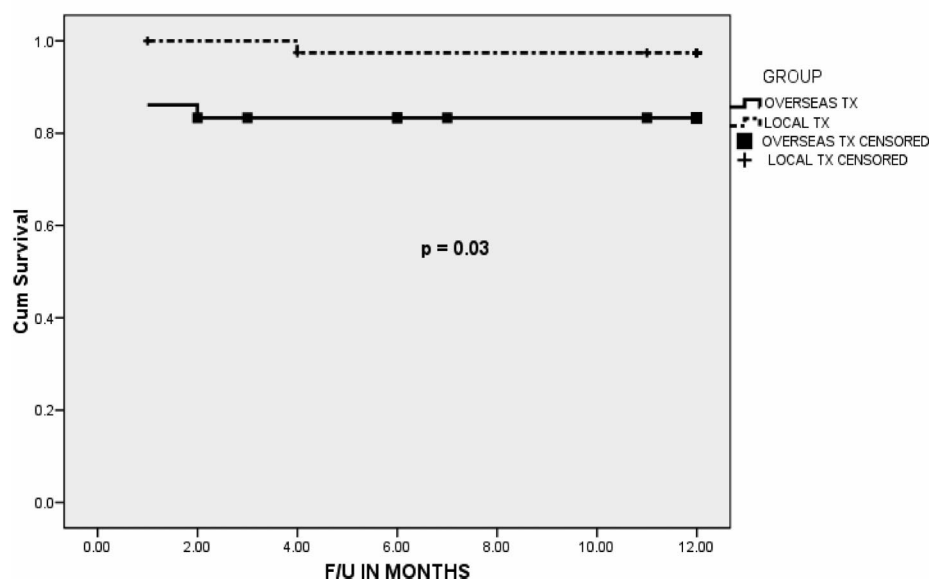


FIGURE 1. One-year patient survival for IA patients transplanted abroad and receiving LD kidneys in the in United Kingdom. LD, local living donor; Tx, transplantation.

transplanted overseas were on was consistent with local practice: a calcineurin inhibitor, antiproliferative agent, and corticosteroids.

In the overseas group, six (17%) patients died within 3 months of transplantation; two from fulminant sepsis, and one from bowel infarction. The cause of death of the other three patients was uncertain, but believed to be cardiac in origin. Five (12%) grafts failed within 1-year of transplantation; three failed between 2 and 8 months after episodes of severe rejection (biopsy proven). There was one early graft loss (on day 4), which was probably secondary to renal artery thrombosis. The cause of the remaining graft loss was unknown. One-year graft survival was 87%, and 1-year patient survival was 83%. Composite graft and patient survival was 69.5% at 1 year.

It is interesting to note the clinical outcomes for the two patients who were excluded from the study because of different ethnicity. The Chinese patient lost his kidney 2 years after transplantation secondary to chronic rejection and the white patient died 2 months after transplantation because of methicillin-resistant *Staphylococcus aureus* pneumonia.

One-year patient survival in the locally transplanted group was 97.5% (39 of 40); one patient died with a functioning graft because of cardiac failure. There was a statistically significant difference in patient survival between the two groups, $P=0.03$ (Fig. 1).

Graft survival was 97.5% (39 of 40) at 1 year. The graft was lost because of a technical failure. The statistical difference (P value) in the graft survival between the two groups was 0.06 (Fig. 2). Composite graft and patient survival was 95% in the UK LD group ($P=0.003$).

Of 39 transplant episodes in the overseas group, 15 (42%) were followed up by major viral complications. These included six episodes of CMV disease (40%), four hepatitis B (27%), and five Hepatitis C (33%) infections. In comparison, there were no hepatitis B or hepatitis C

infections in the locally transplanted group, although there were an equal number of CMV infections. There was a statistically significant difference in the incidence of viral infections between the two groups ($P=0.02$).

There was no difference in outcomes in the overseas group between patients who were not on the transplant list when compared with those who were active on the UK waiting list. There were three deaths and three graft failures in those not listed and three deaths and two graft failures in those on the list.

In UK DD recipients, the 1-year patient survival was 93% (145 of 156). This is in comparison with 83% in the overseas population, $P=0.06$ (Fig. 3). The 1-year graft survival was 84.6% (132 of 156), whereas in the overseas group, it was 87%, $P=NS$ (Fig. 4). Composite graft and patient survival was 77.6% at 1-year in the UK DD group ($P=NS$).

Of the 24 graft failures, six were because of rejection, five because of surgical complications, four because of primary nonfunction, and one because of recurrent disease. The cause of graft failure was not known in seven patients. Of the 11 patients who died, four were because of myocardial infarction, three because of cardio respiratory failure, three secondary because of pulmonary infection, and one because of pulmonary embolism.

The patient survival in the dialysis group was 96.7% (116 of 120) in comparison with 835 in the overseas IA transplant population, $P=0.001$ (Fig. 5). The cause of death was cardiac in origin in all the four patients.

DISCUSSION

The growth of LD transplantation has been an important recent development in the management of ERF. The rate of local LD transplantation in the United Kingdom in the IA population is much lower than that for whites (3). This study, carried out in a region where IAs

COMPARISON OF 1 YEAR GRAFT SURVIVAL BETWEEN INDO-ASIAN PATIENTS TRANSPLANTED IN THE U.K AND ABROAD

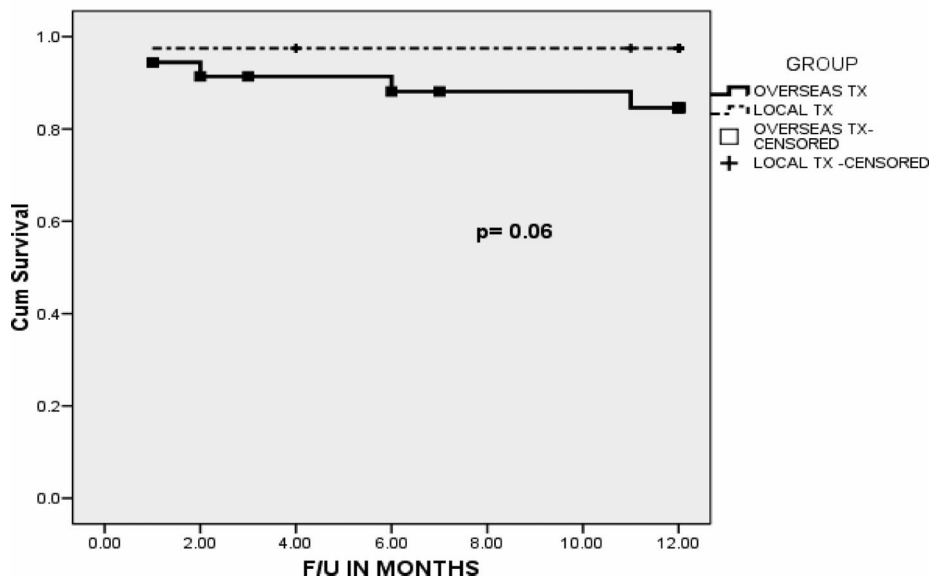


FIGURE 2. One-year graft survival for IA patients transplanted abroad and receiving LD kidneys in United Kingdom. LD, local living donor; Tx, transplantation.

COMPARISON OF 1 YEAR PATIENT SURVIVAL BETWEEN INDO-ASIANS TRANSPLANTED ABROAD AND THOSE WHO RECEIVED DECEASED DONOR KIDNEY IN THE U.K

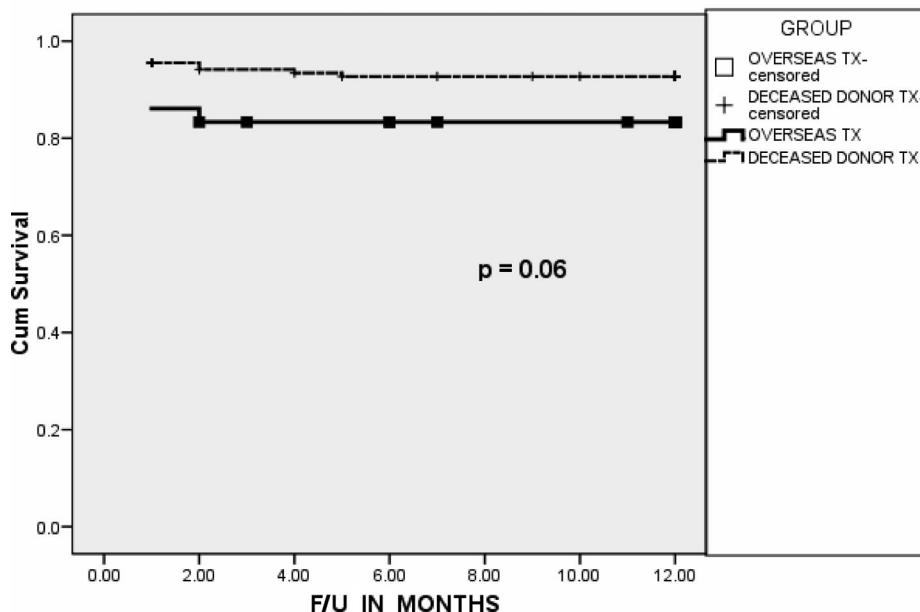


FIGURE 3. One-year patient survival for IA patients transplanted abroad and those who received DD kidneys in the United Kingdom. DD, deceased donor; Tx, transplantation.

comprise a high proportion of the ERF population, found that during a 10-year period from April 1996, IA patients underwent local LD transplantation at one quarter of the rate seen for DD transplantation.

Transplant tourism in Indoasians resident in West Midlands comprised 47% of all live donor transplantation. The majority of these patients (21 of 36) received the transplant in Pakistan. Although the sale of organs for transplantation has been illegal in India since 1994 (11), in Pakistan, there is no legal framework to prevent this practice; recently, Naqvi et al. (12) and identified that two thirds of all LD transplantation in Pakistan may be into foreigners. In the same

study, the profound exploitation of paid donors in Pakistan was explicitly identified: the large majority are poor, illiterate, and bonded workers. Donation in this setting does not usually lead to long-term economic benefit and 98% of donors report health problems after donation. The practice of transplant tourism has been repeatedly condemned by mainstream opinion, most recently in the widely publicized and published Declaration of Istanbul (9).

The decision of a UK IA patient to engage in transplant tourism is likely to be multifactorial but strongly associated with the unavailability of transplantation in the United Kingdom to many of those who wish to receive a transplant. The

COMPARISON OF 1 YEAR GRAFT SURVIVAL BETWEEN INDO-ASIANS TRANSPLANTED ABROAD AND THOSE WHO RECEIVED DECEASED DONOR KIDNEY IN THE U.K

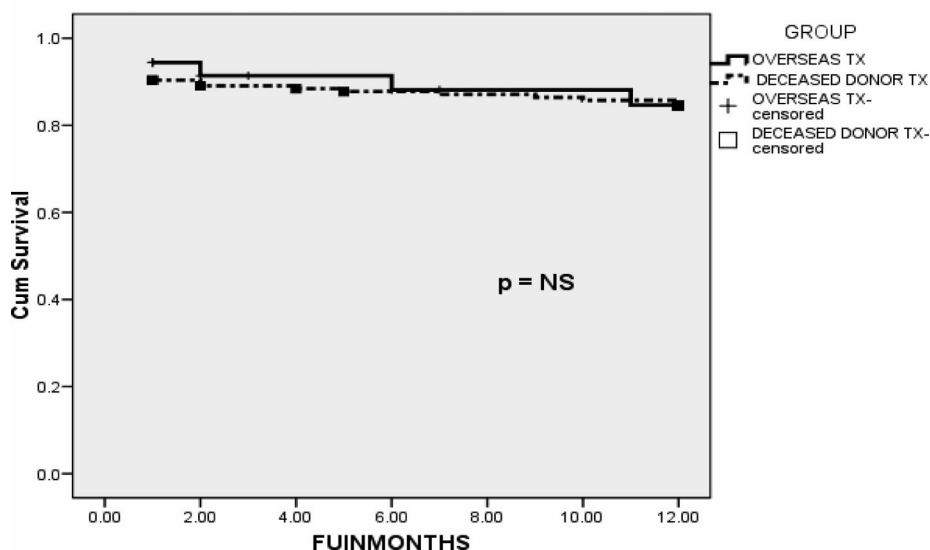


FIGURE 4. One-year graft survival for indoasian patients transplanted abroad and those who received DD kidneys in the United Kingdom. DD, deceased donor; Tx, transplantation.

COMPARISON OF 1 YEAR PATIENT SURVIVAL BETWEEN INDO-ASIANS TRANSPLANTED ABROAD AND THOSE ON DIALYSIS IN U.K

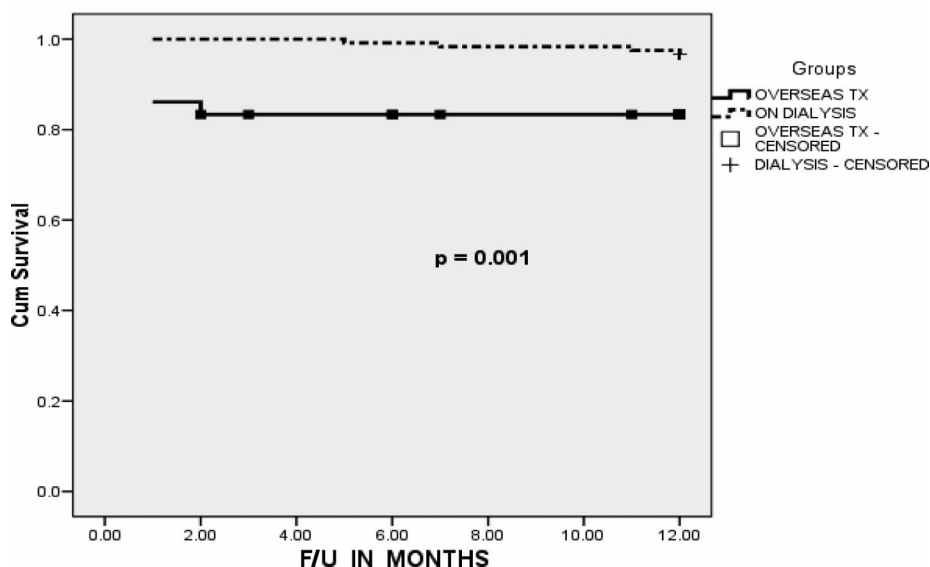


FIGURE 5. One-year patient survival for IA patients who were transplanted in abroad and those receiving dialysis in the United Kingdom. IA, Indoasian; Tx, transplantation.

majority of the transplant tourists (20 of 36, 56%) were not wait-listed for DD transplantation in the United Kingdom. Although six patients were believed to be high surgical risk, the majority of them were either being worked up or did not want to be on the list. Thus, it seems likely that this cohort of IA patients preferred paid kidney donation. It must be said that there may be differences in the selection of patients for transplantation based on ethnicity; studies from other countries show that non-whites are less likely to be listed for a kidney transplant. Also, the long waiting time because of tissue and blood group incompatibility is another factor for transplant tourism.

Second, it is a known fact that not all people with advanced or dialysis-dependent ERF are fit for a kidney transplant (1); this is because the risks of the treatment outweigh the benefits. To clarify the risk so that the patient understands

why transplantation is not available to them in the UK can be challenging; some IA patients may be disproportionately affected by communication shortfalls (13) and not explicitly aware of the risk of kidney transplantation to them. Subsequently, they may travel for transplantation without access to all the information that they require for a clear understanding of the risks that they are exposed to.

Third, there are low numbers of IA living kidney donors in the United Kingdom. This is a complex area: contributing factors may include lack of sufficient culturally adapted communication, incorrect assumptions among patients and their families about lack of support from their religious and community leaders, and high rates of comorbidity that exclude from donation many of those who come forward for assessment.

A further consideration is the accessibility of paid live donation; if transplant tourism is available in the regions from which the family of the patient with ERF migrated, then local community support and knowledge of process in the country of transplantation make this treatment a more viable option. If the situation was reversed, that is, white UK nationals had migrated to Pakistan, developed ERF, and had poor access to transplantation, a similar pattern of activity would be seen if transplant tourism was available in the United Kingdom.

The outcomes of transplant tourists were poor, more than 30% of cases resulted in either patient death or graft loss (14). Also, when compared with the UK DD transplant group, the patient survival was much lower, although there was no difference in the graft survival. These outcomes are worse than those reported for smaller cohorts of UK ERF patients participating in transplant tourism (7, 15), but similar to the results of some other studies (16, 17). Two recent studies, from the United States and Taiwan, found no differences in either graft or patient survival between overseas commercial kidney transplantation and domestic “legal” transplantation (8, 18).

Although poor, results that we report may in part reflect the comorbidity of those who traveled, the high rates of viral infections (42%) posttransplant were independent of recipient comorbidity, and indicate the uncontrolled environment in which the transplants were performed. A high incidence of viral infections is reported in all series of overseas kidney transplantation (16, 17, 19–21). In addition to the spectrum of viral infections that are reported in this study, previous studies have reported individuals acquiring HIV from transplant tourism (16, 17, 19, 20).

These reports are not representative of the outcome of all transplants in the subcontinent (11). There are centers of excellence in India and Pakistan, where the rate of graft and patient survival is as good as those in centers in the developed world. However, these centers are no party to commercial nonrelated LD transplantation and, therefore, are not accessible to transplant tourists. Although some argue that commercial transplants should be permitted in a regulated manner (22), until a system is in place that transparently protects the transplant donor and there is international consensus that this system is morally and operationally acceptable, patients should be actively discouraged from transplant tourism.

In conclusion, this study reports a low relative incidence of LD kidney transplantation into people of IA ethnicity in the United Kingdom and poor clinical outcomes for those who travel as transplant tourists. There is a need for strategies to optimize LD transplantation for IAs in the United Kingdom, to provide directed on the risks of transplant tourism, and continued engagement to encourage an appropriate regulatory and clinical infrastructure in Pakistan and other countries where organs are available for transplant tourism.

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