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Commercial kidney transplantation: Trends, outcomes and challenges—A single-centre experience

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Abstract

Background/Objective: Many experts believe that commercial organ transplants continue unabated despite international efforts to curb them. The aim was to determine the trends, outcomes and challenges of commercial living unrelated renal transplants (LURT) as seen in our institution.

Materials and Methods: A retrospective study of LURT patients on follow-up at our institution.

The list of all LURT patients was obtained from our renal registry. Inclusion criteria for the study were 1) Presentation to our hospital within the first month post transplant; 2) Completion of one-year follow-up OR patient or allograft losses prior to completing one-year follow-up. SPSS 17.0 was used for data analysis.

Results: Forty-five patients satisfied the entry criteria; 33 males and 12 females with age range 13-68 years, and mean \pm SD of 40 + 15 years. The majority (28) of the transplants were carried out in Pakistan, the remaining in Egypt, Philippines, and China. There has been a steady decline in the number of new patients with commercial transplants over a four-year period. Complications encountered included infections in 19 (42.2%) patients, biopsy-proven acute rejections in nine patients (20%), surgical complications in 10 patients (22.2%), post-transplant diabetes in seven (15.6%), delayed graft function in one (2.2%), and chronic allograft nephropathy in one (2.2%) patient. Patient survival at one year was 97.8% and allograft survival was 88.9%.

Conclusions: Commercial kidney transplant is on the decline as seen in our center, likely as a result of international efforts to curb it, as well as due to a parallel increase in renal transplants in the country. One-year patient and allograft survivals are good but there is a relatively high rate of infections.

Keywords: Commercial, kidney transplant, outcome

Résumé

Contexte/objectif: Beaucoup d'experts estiment que les transplantations d'organes commerciaux continuent sans relâche malgré les efforts internationaux visant à lutter contre eux. L'objectif était de déterminer les tendances, résultats et défis de la vie commerciale sans lien avec les greffes rénales (LURT) comme dans notre institution.

Matériel et méthodes: Une étude rétrospective des patients LURT sur le suivi de notre établissement.

La liste de tous les patients LURT proviennent de notre greffe rénale. Critères d'inclusion de l'étude ont été 1) présentation de notre hôpital dans la premier mois post greffe; 2) Réalisation an suivi OR patient ou allogreffe pertes avant de compléter le suivi d'un an. 17,0 SPSS a été utilisé pour l'analyse des données.

Résultats: Quarante-cinq patients satisfait les critères d'admission; 33 mâles et 12 femmes avec l'âge allant de 13-68 ans et la moyenne de \pm SD de 40 + 15 ans. La majorité (28) les greffes ont été réalisée au Pakistan, les autres en Egypte, aux Philippines et en Chine. Il y a eu un déclin constant du nombre de nouveaux patients avec greffes commerciales sur une période de quatre ans. Les complications rencontrées inclus les infections dans 19 (42,2%) patients, biopsie éprouvée des rejets aigus chez neuf patients (20%), les complications chirurgicales chez 10 patients

(22,2%), diabète post-greffe dans sept (15,6%), greffon retardée (2,2%), une fonction et la néphropathie chronique allogreffe chez un patient (2,2%). Survie des patients à un an était de 97,8% et survie de l'allogreffe à 88,9%.

Conclusions: Greffe de rein commerciale de est sur le déclin comme vu dans notre Centre, susceptible d'efforts internationaux pour lutter contre elle, mais aussi en raison d'une augmentation parallèle des transplantations rénales dans le pays. Les survies patients et allogreffe d'un an sont bons, mais il y a un taux relativement élevé d'infections

Mots clés: Commercial, transplantation rénale, résultat

Introduction

The waiting time for kidney transplants is continually increasing despite persistent efforts to increase the number of deceased and living related donor organs. Consequently, despite the ethical issues, many patients resort to commercial, living unrelated renal transplantation (LURT).

There have been efforts in the last few years internationally to curb commercial organ transplants. However, many experts believe that commercial organ transplants continue unabated.^[1,2] Conflicting data have been published regarding the outcomes and complications of LURT.^[2]

The objectives of this study were to determine the trends, outcomes and challenges of LURT as seen in our institution over a four-year period (2006-2009).

Materials and Methods

The list of all LURT patients was obtained from our renal registry data. Patients' case records were traced and relevant demographic and clinical information obtained. Inclusion criteria for the study were:

Presentation to our hospital for follow-up within the first month post transplant.

Completion of one-year follow up OR patient or allograft losses prior to completing one-year follow-up.

Extracted data was entered into computer-based statistical software (SPSS 17.0 for Windows) and analyzed.

Statistical analysis used

Quantitative data was summarized with ranges, means \pm standard deviations. Qualitative data were presented as percentages.

Results

Forty-five patients satisfied the entry criteria of the study; 33 males and 12 females with age range 13-68 years, and mean \pm SD of 40 ± 15 years. All the patients had commercial LURT outside the

kingdom. None of the LURTs were emotionally related transplants. The majority (28) of the transplants were carried out in Pakistan. The rest were carried out in Egypt (10), Philippines (6), and one in China [Figure 1]. There has been a consistent decline in the number of new patients with commercial transplants over a four-year period, from 2006 to 2009 [Figure 2].

Serum creatinine at presentation was $42-705 \mu\text{mol/L}$ with mean \pm SD of $161 \pm 149 \mu\text{mol/L}$ and at one year $67-425 \mu\text{mol/L}$ with mean \pm SD of $122 \pm 57 \mu\text{mol/L}$. The majority of the patients had good graft function at one year with serum creatinine less than $132 \mu\text{mol/L}$ (1.5 mg/dl). Six patients (13.3%) had mild elevations of creatinine ($140-185 \mu\text{mol/L}$) but

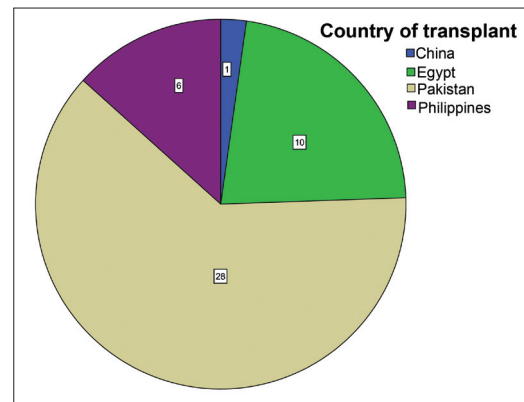


Figure 1: Countries of commercial transplant

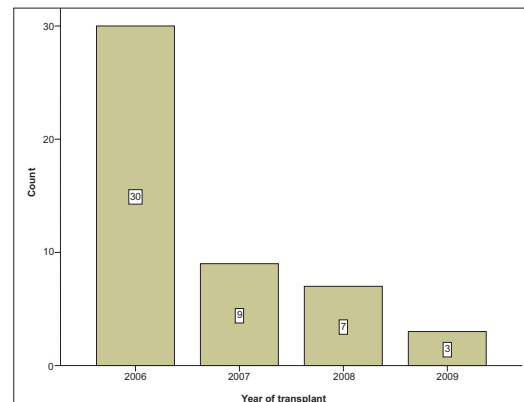


Figure 2: Trend of new patients presenting after commercial transplants abroad

Note: This data is up to June 2009 and therefore includes patients who had not completed one-year follow-up.

stable graft function. Only one patient had advanced chronic allograft nephropathy with creatinine of 425 $\mu\text{mol/L}$.

Thirty-seven (82.2%) patients were on cyclosporine, mycophenolate mofetil (MMF) and prednisolone immunosuppressant protocol, while eight (17.8%) were on tacrolimus, MMF and prednisolone protocol.

Complications encountered are summarized in Table 1. Infections were the commonest complications, confirmed in 19 (42.20%) patients, four of them with multiple infections. The infections include urinary tract infection (UTI) in nine (20%) patients, cytomegalovirus (CMV) in six (13.3%) patients, wound infections in four patients (8.8%), genital herpes in one patient (2.2%) and chickenpox in one patient (2.2%). Isolates of UTI included *Escherichia coli* in five patients (four of the isolates were extended spectrum beta lactamase (ESBL) producing), *Klebsiella pneumonia* (ESBL-producing) in two patients, *Enterococcus* in two patients, and *Acinetobacter baumani* in one patient. Three of the patients with *E. coli* UTI had associated bloodstream infections with the same organism. Isolates from the wound infection included *Pseudomonas auriginosa* in three patients, *Staphylococcus aureus* in one patient and *Mycobacterium fortuitum* in one patient. Post-transplant diabetes mellitus occurred in seven patients (15.6%). Nine patients (20%) had biopsy-proven acute rejections which responded to pulse steroids except one patient who lost the graft due to severe vascular rejection. One patient had delayed graft function and one had biopsy-proven chronic allograft nephropathy (CAN).

Surgical complications occurred in 10 patients (22.2%) as summarized in Table 1.

Table 1: Post transplant complications in the study population

Complication	Number (%)
Medical	
Infection	19 (42.2)
Acute rejection	9 (20)
NODAT	7 (15.6)
Delayed Graft function	1 (2.2)
Chronic allograft dysfunction	1 (2.2)
Surgical (excluding wound infection)	
Ureteric stenosis	3 (6.7)
Severe RAS	3 (6.7)
Urine leak	1 (2.2)
Renal allograft artery thrombosis	1 (2.2)
Wound hematoma	1 (2.2)
Renal allograft infarction	1 (2.2)

RAS= Renal allograft artery stenosis. NODAT= New onset diabetes after transplant.

Patient survival at one year was 97.8% while allograft survival was 88.9%. The five graft losses were due to one case each of death with a functioning graft, allograft artery thrombosis, renal allograft infarction, severe renal artery stenosis and severe vascular rejection.

Discussion

Currently, the Kingdom of Saudi Arabia (KSA) has the highest rate of living renal transplants in the world with a reported rate of 32 procedures per million population.^[3] However, there are concerns that a significant number of these transplants are commercial transplants carried out abroad.^[4]

The World Health Organization (WHO), the Transplant Society as well as the governments of many countries have taken several steps to curb the menace of commercial transplant tourism. Notable is the recent Istanbul declaration.^[5] Despite these steps, some experts believe that commercial transplants have continued unabated.^[1,2] However, data from the Saudi Centre for Organ Transplant (SCOT) suggest that commercial transplants have been on the decline in the country since 2007, with the number of living transplants carried out outside the country falling by about 50% from 700 in 2005 to 382 in 2008.^[6] The result from our centre also agrees with this. The decline in commercial transplants may be partly explained by the passage of the Pakistani transplant ordinance in 2007, which is believed to have led to a near halt of commercial kidney transplants in that country.^[7] Another contributory factor to the decline in commercial transplants outside KSA may be the parallel increase in both living and deceased kidney transplantations within the country,^[6] which may have led to a reduced inclination of patients to source for commercial organs abroad. The majority of our patients were transplanted in Pakistan in contrast to the study by Al-wakeel et al., in which the majority of the patients were transplanted in India.^[8] This change most likely occurred as the Indian government prohibited commercial transplants in the 1990s,^[9] shifting transplant tourism to Pakistan where the transplant ordinance was not passed till 2007.^[7]

There had been conflicting reports of the outcome of commercial transplants worldwide. A recent systematic review of 27 publications from several countries revealed that although some studies report good outcomes of LURT, the majority report poor outcomes.^[2]

The results from our center show a good one-year patient survival (97.8%) which is comparable to the

Table 2: Summary of previous publications on commercial transplants in KSA

Authors	Journal	Year	n	Remarks
Al-Khader <i>et al.</i> ^[15]	The Lancet	1990	90	Good survival, but incidences of HIV
Onwubalili <i>et al.</i> ^[16]	Transpl Int	1994	16	Risk of dangerous infections
Mansy <i>et al.</i> ^[17]	Nephron	1996	12	Lower survival, 70% at 2 years
Hussain <i>et al.</i> ^[18]	Transpl proc	1996	56	Good survival
Al-Shohaib <i>et al.</i> ^[19]	Nephron	1996	8	Poor survival (50%)
study group. ^[20]	Clin transpl	1997	540	Largest study from KSA
Al-wakeel <i>et al.</i> ^[8]	Saudi jkdt	2005	60	Good patient and allograft survival
Total Patients			782	

n= number of patients; KSA= Kingdom of Saudi Arabia

one-year survival of living related renal transplants in the KSA (98.4%).^[10] The one-year mortality rate in our study (2.2%) is much lower than the mortality rate of 12.7% in the first six months in hemodialysis patients reported by Mohamed in 2005.^[11] One-year allograft survival of our patients is also good (88.9%) but relatively inferior to that of LRT in KSA (96.7%).^[10] One limitation of this study is that only one-year outcome was reported since our transplant clinic became active in 2006, and no patient had reached five years post transplant at the end of this study period. However, we envisage that five-year graft survival may ultimately be good in our patients considering the fact that renal function was good in most patients at one year with serum creatinine less than 132 $\mu\text{mol/L}$ (1.5 mg/dl). Serum creatinine less than 132 $\mu\text{mol/L}$ has been shown to be a predictor of long-term allograft survival.^[12]

Infection rate at one year was relatively high (42.2%) with UTI as the commonest infection, which is in keeping with the known fact that UTI is the commonest infection in renal transplant patients.^[13] Infections in our patients included potentially life-threatening infections such as *Pseudomonas*, *Acinetobacter*, and ESBL-producing organisms. Infection with ESBL organisms is increasingly recognized in renal transplant patients, accounting for both morbidity and mortality.^[14] Although no mortality was encountered with the ESBL infections in our patients, they accounted for significant morbidity as the patients had to be admitted for administration of meropenem, with one patient requiring several admissions due to relapse. There were several other medical and surgical complications encountered as summarized in Table 1.

There have been seven publications on commercial transplants from KSA over the last two decades involving 782 patients as summarized in Table 2.^[8,15-20] All the studies, apart from two, reported good allograft and patient survival, though with significant incidences of serious infections.

However, even if recipient outcomes are good and ethical issues are set aside, commercial transplants should not be condoned because of studies showing poor outcomes in the donors of commercial transplants.^[9,21] It is hoped that as transplant activities increase steadily in KSA, commercial transplants abroad will ultimately cease.

We conclude that commercial kidney transplant is on the decline as seen in our center, likely as a result of international efforts to curb it, as well as due to a parallel increase in kidney transplants in KSA. One-year patient and allograft survivals are good but there is a relatively high rate of infections including ESBL organisms.

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