Royal Free London NHS Foundation Trust

DEPARTMENT OF RENAL MEDICINE
CENTRE FOR TRANSPLANTATION

UCL

Impact of frailty on early and late hospital readmission after kidney transplantation

Heidy Hendra[1], Bynvant Sandhu[1], Ewa Frackiewicz[1], Gareth Jones[1], Philip Masson[1], Reza Motallebzadeh[1,2,3]

1. Centre for Transplantation, Department of Renal Medicine, University College London & Royal Free London NHS Foundation Trust
2. Institute of Immunity & Transplantation, UCL
3. Research Department of Surgical Biotechnology, Division of Surgery & Interventional Sciences, UCL

Introduction

Frailty is a state of reduced ability to recover from physiological stressors and affects up to 70% of patients with end-stage kidney disease (ESKD). Currently no tools exist to predict the effect of frailty on outcomes after kidney transplantation (KTx). We aimed to assess the impact of frailty on outcomes post-KTx.

Methods

Cohort study of all incident transplant recipients 2016 to 2019. We measured frailty with the Rockwood Clinical Frailty Score (CFS), and categorized patients into 2 groups: non-frail (CFS 1-3) and frail (CFS 4-6). Outcomes were: patient and death-censored graft survival; all-cause and infection-related re-admission rates (30 day and 1yr).

We examined associations between exposure variables and outcomes using chi-squared, t-test and Mann-Whitney tests and plotted Kaplan Meier survival curves for death and graft survival. Univariate and multivariate associations of frailty with death and graft survival were examined using logistic regression, expressed as odds ratios (OR) and 95% confidence intervals (CI).

Results

Of 219 patients in 377 person-years of follow-up, 2 died within 30 days in both groups, and 13 in total by the end of the study. Unadjusted patient survival was higher in non-frail kidney recipients, but not when adjusted for other baseline characteristics (OR 1.89, CI 0.46 to 7.72) (**Figures 1 and 3A**). Unadjusted death-censored graft survival was similar for both groups, and remained similar in multivariate analyses (OR 0.79, CI 0.15 to 4.14) (**Figures 2 and 3B**). In multivariate adjusted models, each year of RRT pre-transplant increased risk of death by 28% (OR 1.28, CI 1.01 to 1.63). For graft failure, each year older a donor was increased risk of graft failure by 9% (OR 1.09, CI 1.02 to 1.16). Donor type also affected risk of graft failure (p=0.03) (**Figure 3**).

All-cause readmission rates were no different at 30 days, but greater by 1 year (**Figure 4**). Frail recipients, irrespective of their age, were much more likely to experience readmission due to post-transplant infections, especially by 1 year (**Figure 5)**

Results

Table 1: Baseline characteristics

	Frailty score 1 - 3 (n=166)	Frailty score 4 - 6 (n=53)	*p*-value
Recipient factors			
Age, years (mean ± SD)	50.5 ± 13.2	55.7 ± 13.3	**0.006**
Male sex (%)	62.65%	56.60%	0.43
Ethnicity (%)			
Caucasian	44.6	39.6	0.53
Other	27.1	34	0.34
Black	28.3	26.4	0.79
BMI, kg/m² (mean ± SD)	26.7 ± 4.6	26.6 ± 4.6	0.26
ESRF due to diabetes (%)	16.87%	39.62%	**0.0005**
Positive Myocardial perfusion scan (%)	15.66%	24.53%	0.14
Pre-emptive transplant (%)	21.08%	5.66%	**0.009**
Dialysis modality (%)			
Haemodialysis (HD)	46.99%	71.70%	**0.002**
Peritoneal dialysis (PD)	27.11%	20.75%	0.36
Time on dialysis, days (median (IQR))	841 (86.5-1338)	951 (505-1850)	0.14
Transplant characteristics			
No of transplant (%)			
=1	88.6	88.7	
>1	11.4	11.3	
Donor type (%)			
Live donor	22.3	13.2	
DBD	53	66	
DCD	24.7	20.8	
ECD	33.1	39.6	0.39
Donor age, years (mean ± SD)	50.2 ± 15.2	52.7 ± 14.1	0.48

Figure 1. Patient survival

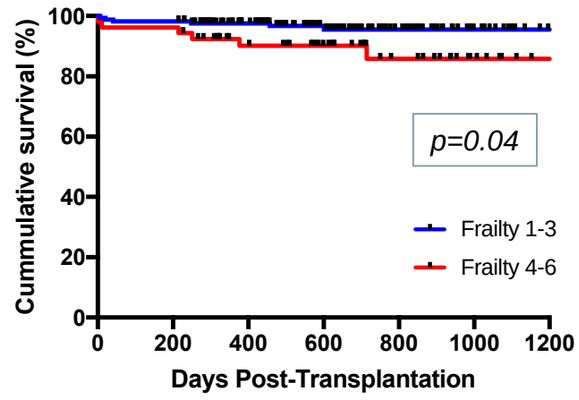


Figure 2. Death-censored graft survival

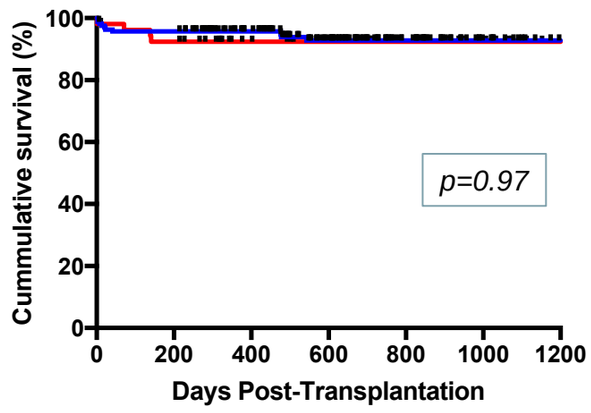


Figure 3. Associations of baseline cohort characteristics with risk of (A) death and (B) graft loss

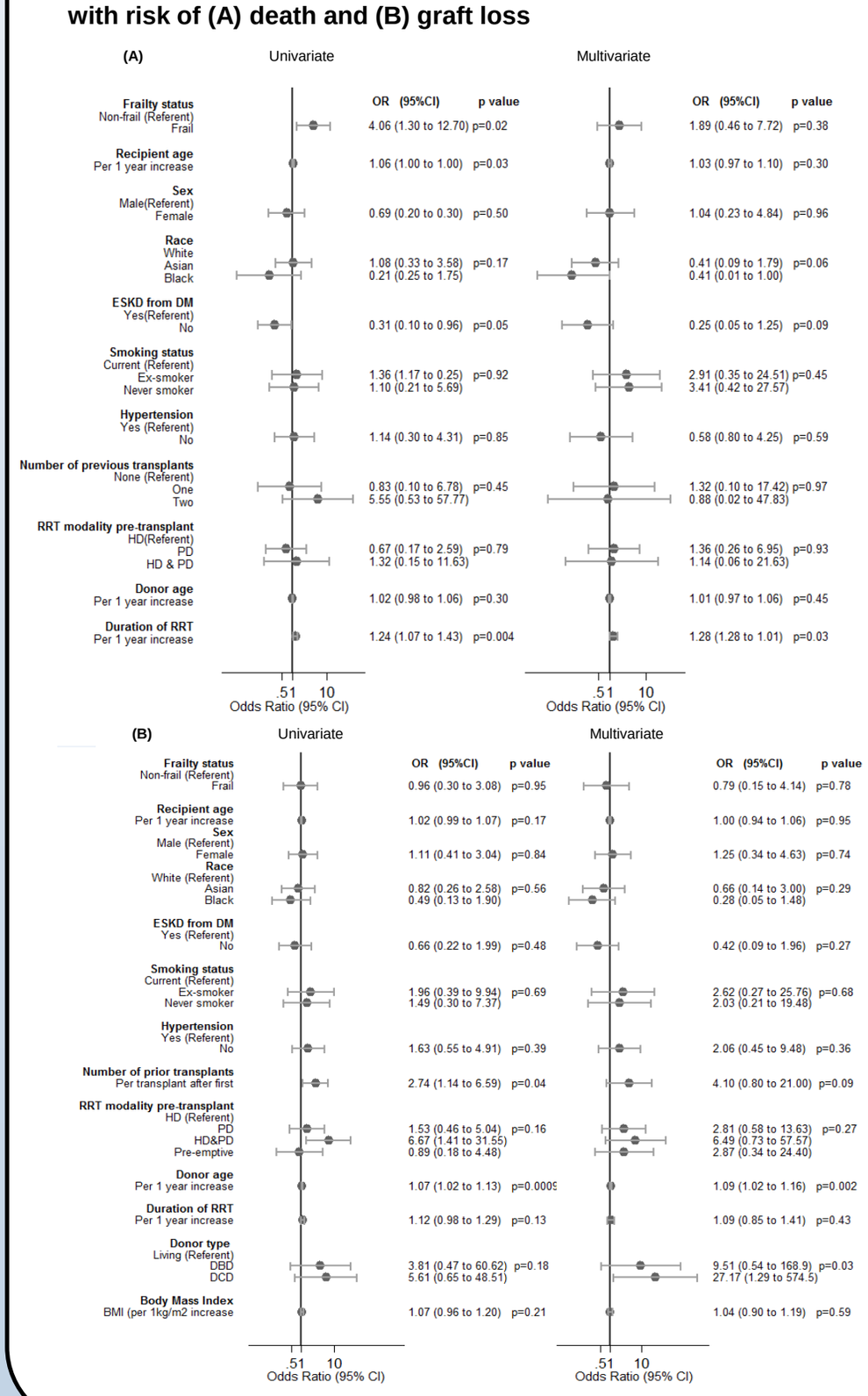


Figure 4. Incidence of 30 day & 12 month hospital all-cause readmission, by age and frailty.

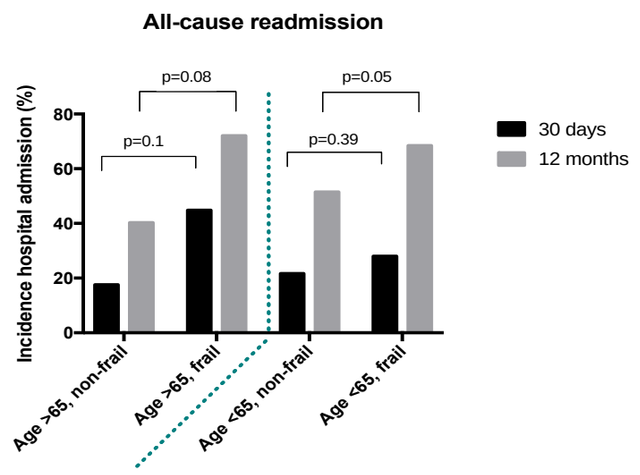
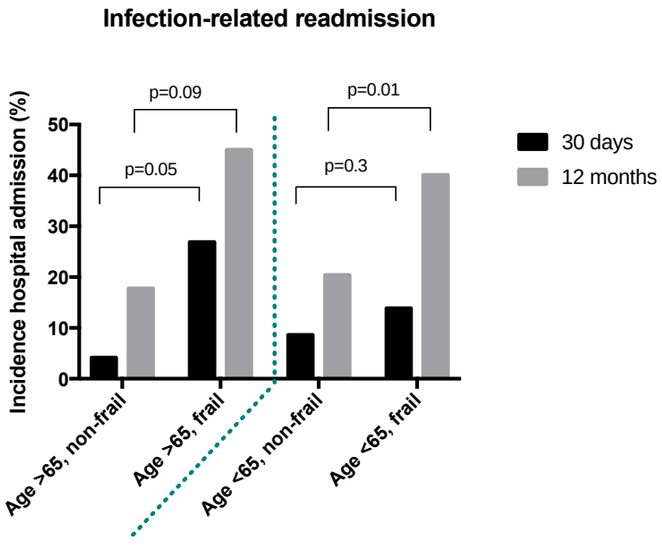


Figure 5. Incidence of 30 day & 12 month infection related readmission, by age and frailty.



Conclusions

Regardless of age, frailty is a risk factor for post-KTx morbidity.

Identifying frailty amongst KTx recipients is an important step in predicting postoperative complications, and should be used as prognostic tool in transplant assessments.

This might allow for targeted outpatient monitoring and intervention, such as optimization of nutrition, aggressive and planned physical rehabilitation before and after transplantation, and modification of immunosuppression, in order to reduce hospital readmission rates and post-transplant infectious complications.