Comparable graft survival of re-transplantation in elderly kidney recipients in regard to rejection

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Introduction

Older adults comprise an increasing proportion of patients on the waiting list for and receiving kidney transplants (KTs) worldwide.

Despite the survival benefits compared to dialysis, older patients experience lower patient and graft survival.

However, the age-related modifications in the immune system contribute to a decrease in rejections.

We hypothesized that immunological challenges in re-transplantation might be overcome in elderly recipients due to immunosenescence.
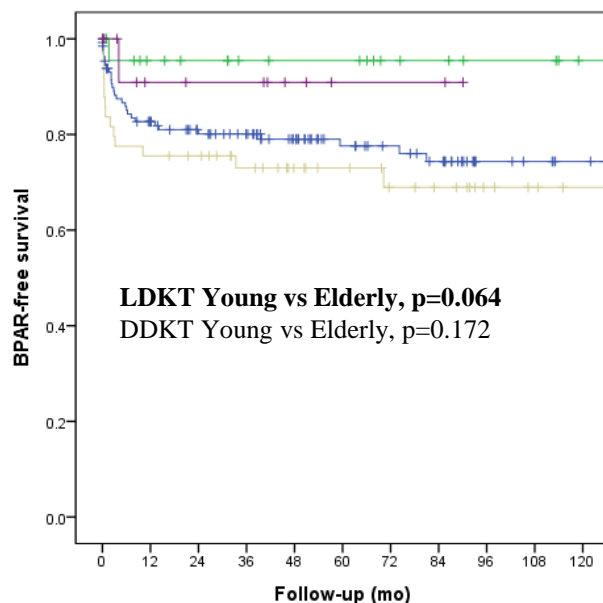
Methods
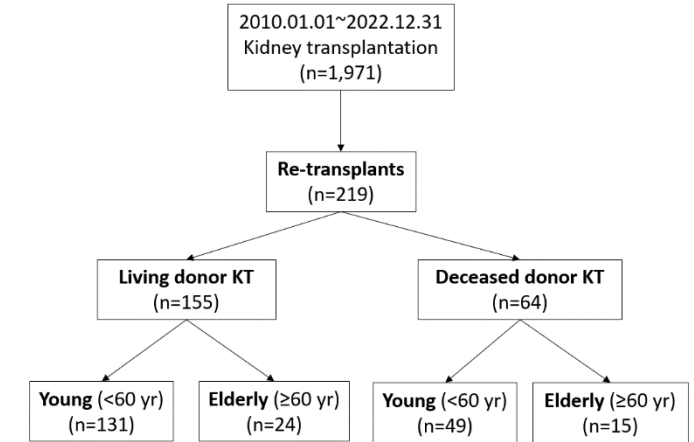
Results

Table 1. Incidence of graft outcomes and complications according to the recipient's age at the time of KT

Variable	Living donor KT			Deceased donor KT		
	Young (<60yr)	Elderly (≥60yr)	p-value	Young (<60yr)	Elderly (≥60yr)	p-value
No. of patients	131	24		49	15	
Delayed graft function	7 (5.3%)	2 (8.3%)	0.420	7 (14.6%)	6 (40.0%)	0.044
Graft failure	8 (6.1%)	4 (16.7%)	0.093	5 (10.2%)	1 (6.7%)	0.568
Rejection	6 (4.6%)	0 (0.0%)		4 (8.2%)	0 (0.0%)	
Recurrent GN	1 (0.8%)	1 (4.2%)		1 (2.0%)	0 (0.0%)	
Primary nonfunction	1 (0.8%)	0 (0.0%)		0 (0.0%)	1 (6.7%)	
Others	0 (0.0%)	3 (12.5%)		0 (0.0%)	0 (0.0%)	
BPAR	29 (22.1%)	1 (4.2%)	0.028	14 (28.6%)	1 (6.7%)	0.073
Early	8 (6.1%)	0 (0.0%)	0.733	8 (16.3%)	0 (0.0%)	0.467
Late	21 (16.0%)	1 (4.2%)	0.733	6 (12.2%)	1 (6.7%)	0.467
Acute TCMR	11 (8.4%)	1 (4.2%)	0.416	10 (20.4%)	1 (6.7%)	0.205
Early	4 (3.1%)	0 (0.0%)	0.667	5 (10.2%)	0 (0.0%)	0.545
Late	7 (5.3%)	1 (4.2%)	0.667	5 (10.2%)	1 (6.7%)	0.545
Active AMR	22 (16.8%)	0 (0.0%)	0.018	8 (16.3%)	1 (6.7%)	0.320
Early	5 (3.8%)	0 (0.0%)		3 (6.1%)	0 (0.0%)	0.667
Late	17 (13.0%)	0 (0.0%)		5 (10.2%)	1 (6.7%)	0.667

Variable	Living donor KT			Deceased donor KT		
	Young (<60yr)	Elderly (≥60yr)	p-value	Young (<60yr)	Elderly (≥60yr)	p-value
Infection-related hospitalization	46 (35.1%)	11 (45.8%)	0.219	18 (36.7%)	9 (60.0%)	0.098
Early	18 (13.7%)	3 (12.5%)	0.394	10 (20.4%)	7 (46.7%)	0.244
Late	30 (22.9%)	8 (33.3%)	0.394	8 (16.3%)	2 (13.3%)	0.244
Malignancy	7 (5.3%)	2 (8.3%)	0.420	6 (12.2%)	1 (6.7%)	0.476
Cardiovascular disease	10 (7.3%)	5 (20.8%)	0.059	10 (20.4%)	4 (26.7%)	0.424
Death	9 (6.9%)	2 (8.3%)	0.533	1 (2.0%)	7 (46.7%)	<0.001
Infection	2 (1.5%)	0 (0.0%)		0 (0.0%)	4 (26.7%)	
Cardiovascular disease	2 (1.5%)	1 (4.2%)		1 (2.0%)	2 (13.3%)	
Cancer	1 (0.8%)	1 (4.2%)		0 (0.0%)	0 (0.0%)	
Others	4 (3.1%)	0 (0.0%)		0 (0.0%)	1 (6.7%)	

Figure 2. Kaplan-meier survival analysis

(A) Biopsy-proven allograft rejection

(B) active antibody-mediated rejection

LDKT Young vs Elderly, p=0.064
DDKT Young vs Elderly, p=0.172

LDKT Young vs Elderly, p=0.047
DDKT Young vs Elderly, p=0.678
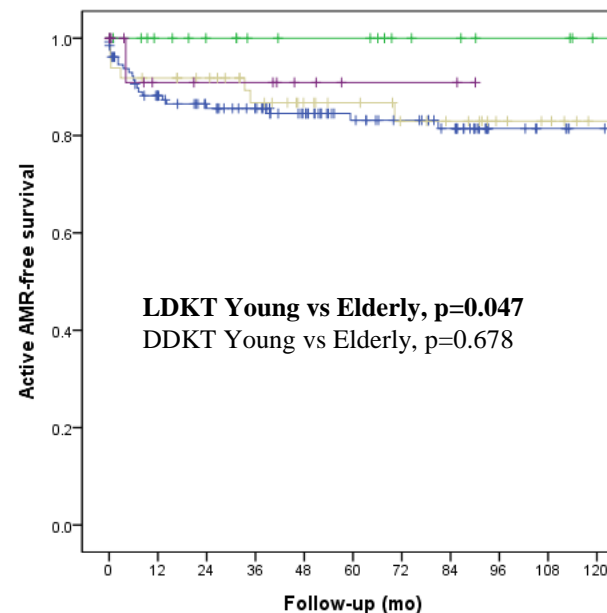
Elderly recipients demonstrated a lower frequency of biopsy-proven allograft rejection.
This was attributed to a decreased rate of AMR in living donor KT.

Death-censored graft survival is decreased in elderly recipients in living donor KT.
However, the cause is not rejection, in contrast to young recipients, and graft function is comparable.

Elderly recipients in deceased donor KT had increased risk of mortality compared with young recipients.
Infection-related hospitalization and mortality was higher in elderly recipients.

Table 3. Multivariable analysis for allograft rejection

Variable	Unadjusted HR (95% CI)	p-value	Adjusted HR (95% CI)	p-value
Recipient sex, male	1.185 (0.658-2.134)	0.572		
Recipient BMI	0.957 (0.868-1.054)	0.373		
Recipient DM	0.353 (0.109-1.138)	0.081		
Donor age	0.993 (0.970-1.016)	0.525		
HLA mismatch number	1.109 (0.926-1.328)	0.260		
XM	3.062 (1.687-5.556)	<0.001	2.918 (1.608-5.295)	<0.001
Living donor	Reference		Reference	
Deceased donor	1.308 (0.704-2.432)	0.396		
Young (<60yr)	Reference		Reference	
Elderly (≥60yr)	0.227 (0.055-0.963)	0.040	0.247 (0.060-1.022)	0.054

Univariable cox regression analysis demonstrated that being elderly (≥60 yrs) was an independent protective factor against the development of graft rejection.

Conclusion

Despite the higher risk of infection-associated and cardiovascular complications, repeat kidney transplantation in elderly recipients is a reasonable choice when done with caution to avoid over-immunosuppression, in regard to low rejection.