

Is Kidney Transplantation Justified in Patients with More Than 10 Years of Dialysis?

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a place of mind

Introduction

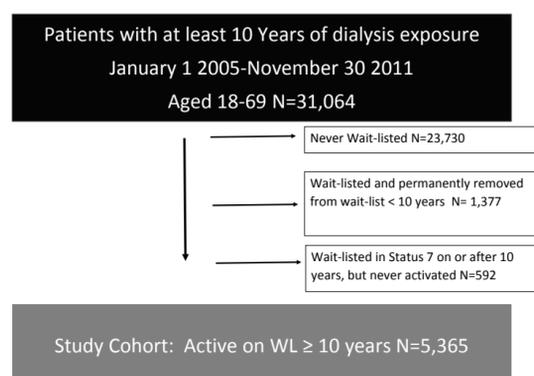
- Transplantation is preferred treatment for ESKD compared to dialysis, this extends to older patients, and patients with comorbid conditions
 - As a result, the demand for organ transplantation is outpacing the supply of transplantable organs and decisions need to be made about who to transplant
- Changes in kidney allocation have resulted in increased access to transplantation to patients with longer dialysis exposure, specifically deceased donor kidney transplantation has tripled in patients with > 10 years of dialysis
- Prolonged dialysis leads to worse outcomes post-transplant, but data about the survival benefit of transplantation is in patients with < 3 years of dialysis

Objectives

- To determine if deceased donor kidney transplantation (KTX) offers a survival benefit over remaining on the waiting list for patients with at least 10 years of exposure to dialysis

Study Population and Methods

- Data: Scientific Registry of Transplant Recipients (SRTR)



- Statistical Methods: Multivariate non-proportional hazards analysis with deceased donor transplantation treated as a time-dependent covariate to account for the fact that patients switched from wait-listing to transplantation at different times¹
 - Survival calculated from 10-year dialysis anniversary until death or end of follow-up (Nov 30, 2016)
 - Censored at living donor transplantation
 - Adjusted for: candidate age, sex, race, BMI, cause of ESKD, comorbidities (PVD, CVA, Angina), PRA, year of dialysis start
 - Subgroup analyses by age, sex, race, cause of ESKD, PRA, expected post-transplant survival

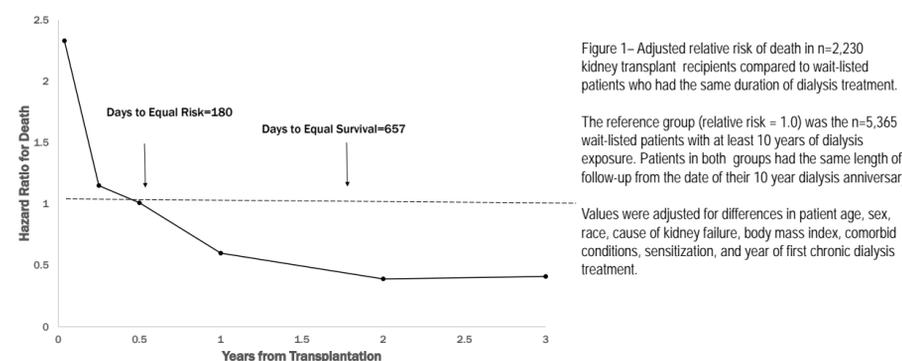
Results

Table 1- Study Patient Characteristics

	Percent		Percent
Age (years)		ABO Blood Group	
18-39	25	A	25
40-49	30	B	18
50-59	28	AB	3
60-69	17	O	54
Female Sex	46	Peak PRA %	
Race		0	27
White	20	1-79	32
Hispanic	17	80-94	7
Black	55	95-98	6
Other	8	99	15
Diabetic ESRD	13	100	13
Body Mass Index (kg/m²)		Insurance status	
<30	69	Private	15
≥30	31	Medicare	72
Angina	4	Medicaid	11
Stroke	2	Other	2
PVD	4	Education < High school	50
Cancer	4		

Study patients were young (55% < 50 years), with few comorbidities. Many patients had biological barriers to transplantation (28% PRA >98%; 18% blood type B); and may have had lower socioeconomic status (i.e. few patients with private insurance, 50% with less than a highschool education, and the majority Black) (Table 1)

- 2,320 (40%) of patients received KTX
 - Median (Q1,Q3) time of 2.30 years (0.9, 4.2)
 - Median (Q1,Q3) KDPI: 44% (25%, 65%); only 6% KDPI > 85%
- Recipients of KTX were at increased risk of death for a period of 180 days after transplantation and then subsequently had a lower risk of death compared to patients who remained on dialysis. (Figure 1)



- Compared to seminal analyses by Wolfe et al,¹ our study patients required a much longer time to achieve a survival benefit, which may be related to a lower death rate on dialysis in the study cohort (Table 3)

Study Data >10 y dialysis	Wolfe et al. Cohort < 3 y Dialysis
Time to equal risk 6 months	Time to equal risk 3 months
Time to equal survival 20 months	Time to equal survival 8 months
Death rate on dialysis=5.8 Death rate post transplant= 3.9	Death rate on dialysis=6.3 Death rate post transplant= 3.8

Results

Table 2- Results from multivariate extended Cox models: overall and in subgroups. Hazard ratios depict the survival benefit of KTX in each listed subgroup.

SUBGROUP	Hazard Ratio for Transplantation 95% CI
Overall	0.60 (0.53, 0.68)
Age (years)	
<40	0.44 (0.32, 0.61)
40-49	0.49 (0.38, 0.63)
50-59	0.49 (0.39, 0.61)
60-64	0.52 (0.38, 0.70)
65-69	0.60 (0.40, 0.91)
Female	0.38 (0.31, 0.46)
Male	0.58 (0.50, 0.68)
Race	
White- non-Hispanic	0.51 (0.39, 0.67)
Black	0.46 (0.34, 0.63)
Diabetes as cause of kidney failure	0.73 (0.58, 0.93)
Other Causes	0.56 (0.49, 0.65)
Panel reactive antibody	
0 %	0.61 (0.49, 0.75)
1-79%	0.60 (0.49, 0.72)
80-89%	0.74 (0.42, 1.32)
90-98%	0.96 (0.60, 1.52)
99-100%	0.60 (0.53, 0.68)
Expected Post Transplant Survival	
1-20%	0.49 (0.35, 0.67)
21-40%	0.51 (0.39, 0.65)
41-60%	0.69 (0.53, 0.90)
61-80%	0.60 (0.46, 0.78)
81-100%	0.75 (0.58, 0.97)

- Transplant recipients had a 40% lower long-term risk of death compared to patients who continued dialysis (Table 2)
- The survival benefit of KTX persisted across subgroups (Table 2), and was greatest in female candidates and candidates aged < 40 years
- There were 22,169 patients (including 64% under the age of 60 years and 27% with diabetes as the cause of ESRD) recrded in the US dialysis registry who had never been wait-listed or transplanted despite > 10 years of dialysis treatment who may be eligible for KTX (Sept 2015)

Discussion

- Improving the survival of end-stage kidney disease patients is the most compelling reason to treat patients with transplantation rather than dialysis
- In a contemporary cohort of patients with > 10 years of pre-KTX dialysis, KTX was associated with a significant survival benefit compared to continued dialysis.
 - However, took nearly 2 years to achieve survival benefit
 - There were few lower quality transplanted kidneys in the study cohort (i.e. KDPI >85%).
- There are >22,000 non wait-listed dialysis patients (plus 3000 prevalent wait-listed patients) with > 10 years of survival who could receive rapid transplantation under the new allocation rules if referred and found suitable for transplantation
 - Further studies are needed to inform the selection of such patients for transplantation and determine whether such patients would also benefit from transplantation with lower quality deceased donor kidneys

References

1 Wolfe RA, Ashby VB, Milford EL, Ojo AO, Ettenger RE, Agodoa LY, Held PJ, Port FK. Comparison of mortality in all patients on dialysis, patients on dialysis awaiting transplantation, and recipients of first cadaveric transplant. NEJM 1999;341(23):1725-30