KIDNEY TRANSPLANTATION IN CHILDREN AND ADOLESCENTS – AN ANALYSIS OF THE OPTN/UNOS DATABASE

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Background

It is very important to investigate whether specific pediatric allocation schemes can not only lead to minimization of waiting time, but also to better clinical outcomes for children with end-stage renal disease (ESRD).

Materials and Methods

We analyzed the OPTN/UNOS data for all patients aged 2-20 years who received kidney transplants from living or deceased donors aged 5-35 years between January 1, 1994 and December 31, 2006. Multiple organ transplants were excluded from this study. The outcome of 4,061 deceased donor kidney transplants (DDKT) was compared with those of 6,410 living donor kidney transplants (LDKT) using univariate and multivariate Cox regression analyses.

Results

Unadjusted graft survival rates of DDKT were significantly lower than those of LDKT (HR=1.53, P<0.001). Chronic rejection was reported in 416 (10.2%) of 4,061 DDKT group compared with 537 (8.4%) of 6,410 LDKT group (P<0.001). A significantly lower incidence of non-compliance was observed in children (1.0%) compared with adolescents (2.3% in age 10-14, P<0.001) and high teens (2.1% age 15-20, P<0.001). Among African American recipients, 67 (3.4%) grafts were lost due to non-compliance as a contributory cause of failure compared with 134 (1.6%) among other races (P<0.001). Multivariate analysis showed that adjusted graft survival rates of LDKT were superior to DDKT (HR=1.22, P<0.001) after adjusting for recipient race, recipient age, regraft status, and HLA mismatch.

Table 1. Recipient characteristics

	Levels	n	Living n (%)	Deceased n (%)	P value
Recipient			n=6,410	n=4,061	
Age (yr)	2-9	2,343	1,474 (23.0)	869 (21.4)	0.005
	10-14	2,641	1,550 (24.2)	1,091 (26.9)	
	15-20	5,487	3,386 (52.8)	2,101 (51.7)	
Female		4,372	2,652 (41.4)	1,720 (42.4)	0.321
Race	African American	1,946	837 (13.1)	1,109 (27.3)	<0.001
	Others	8,525	5,573 (86.9)	2,952 (72.7)	
Regraft		1,098	477 (7.4)	621 (15.3)	<0.001
Donor					
Age (yr)	< 16	1,000	2 (0.3)	998 (24.6)	<0.001
	16 - 35	5,421	2,358 (36.8)	3,063 (75.4)	
	>35	4,046	4,046 (63.2)	0 (0)	
Female		4,896	3,596 (56.1)	1,300 (32.0)	<0.001
Post Transplant Complications					
Dialysis in First Week			316 (4.9)	489 (12.1)	<0.001
Rejection Treatment in 6 months			964 (21.2)	613 (21.5)	0.750
Cause of Graft Loss	Acute	469	236(3.7)	233(5.7)	<0.001
	Chronic	953	537(8.4)	416(10.2)	0.037

Figure. Unadjusted and Adjusted Graft Survival

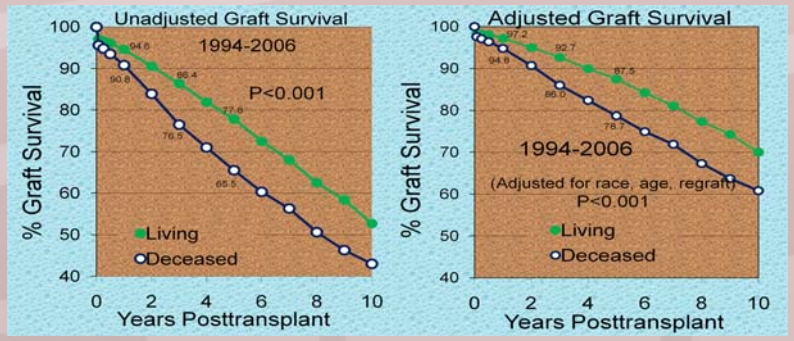

Table 2. Incidence of Noncompliance

	Levels	Overall n (%)	Living n (%)	Deceased n (%)
Recip Age	2-9	23 (1.0)	13 (0.9)	10 (1.2)
	10-14	61 (2.3)	29 (1.9)	32 (2.9)
	15-20	117 (2.1)	68 (2.0)	49 (2.3)
		P=0.001	P=0.018	P=0.028
Recip Race	African American	67 (3.4)	28 (3.4)	39 (3.5)
	Others	134 (1.6)	82 (1.5)	52 (1.8)
		P<0.001	P<0.001	P=0.001

Table 3. Results of Logistic Regression Analyses

		Unadjusted		Adjusted	
Factors	Levels	OR (95% CI)	P value	OR (95% CI)	P values
DDKT vs LDKT		1.53 (1.42-1.65)	<0.001	1.22 (1.12-1.34)	<0.001
Recip race	Afr American	2.01 (1.85-2.20)	<0.001	1.81 (1.66-1.98)	<0.001
	Others	1.0		1.0	
Recip Age (yr)	2-9	1.0		1.0	
	10-14	1.47 (1.30-1.66)	<0.001	1.43 (1.27-1.62)	<0.001
	15-20	1.91 (1.72-2.12)	<0.001	1.87 (1.68-2.08)	<0.001
Regraft vs primary		1.51 (1.35-1.68)	<0.001	1.39 (1.24-1.56)	<0.001
HLA mismatch (0-6)		1.14 (1.11-1.16)	<0.001	1.07 (1.04-1.10)	<0.001

Discussion

Despite improved early graft survival of pediatric kidney transplantation from deceased donor (91% at 1-year), the differences of long-term graft survival rates between deceased and living donor kidney transplant has not been reduced as shown in the Figure (4% at 1-year, 10% 3-year, 12% 5-year for unadjusted survival rates and 3% at 1-year, 6% 3-year, 9% 5-year adjusted survival rates).

Conclusion

It is recommended that a living donor kidney be the first option for children, instead of a deceased donor kidney.