The Effect of Delayed Graft Function on Long Term Graft Survival stratified by KDPI based Donor Kidney Quality Categories

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Introduction: Delayed graft function (DGF) is associated with impaired graft survival in kidney transplant recipients. The kidney donor profile index (KDPI) is increasingly evaluated as a prognostic tool to predict graft quality. However, there is few data that examined the contribution of DGF and donor kidney quality to impaired graft outcomes.

Methods: This retrospective single center study included 580 adult patients who received a deceased donor kidney from 2000-2010. KDPI was calculated using OPTN data as reference and long-term outcomes (mean 8.0 years) were assessed.

Results: Overall mean KDPI was 66%. Further categorization according to KDPI (<35% (n=99), 35-85% (n=264) and >85% (n=217) resulted in a very high mean KDPI of 95% in the group with the highest KDPI. Due to the nature of the European Senior Program (ESP) this group showed a significantly higher recipient age (64 years compared to 47 and 48 years in the <35% and 35-85% groups, respectively). As expected, at 10 years patients living with functioning graft (71.9%, 58.5%, 31.3%) and death censored graft survival (86.7%, 76.9%, 55.6%) decreased with increasing KDPI (Fig. 2 a,b). Intriguingly, rates of DGF (<35%: 35.4%, 35-85%: 50.0%, >85% 53.9%) did not increase proportionally with higher KDPI. This might represent the ESP driven effect by local allocation of kidneys >65 years in order to lower cold ischemia time. Moreover, severity of DGF, estimated by the number of dialysis sessions, was distributed homogenously over the KDPI groups (Fig. 1). However, DGF had a significant negative effect on long term graft survival in all KDPI categories (Fig.2 c,d). A multivariate Cox regression analysis adjusted for KDPI and cold ischemia time revealed DGF as an independent risk factor for premature graft loss (HR 1.97, p<0.001).

Table 1: Patient characteristics by KDPI category

KDPI category	<35%	35-85%	>85%	P value
Patients included	99	264	217	
Mean KDPI (SD)	16 (10)	61 (14)	95 (4)	<0.001
Mean recipient age, years (SD)	46.5 (11.2)	48.4 (12.2)	63.5 (9.3)	<0.001
Mean donor age, years (SD)	30.5 (9.6)	50.2 (8.0)	69.5 (6.4)	<0.001
Female gender, n	43 (43%)	95 (36%)	94 (43%)	0.196
Median time on dialysis, years (IQR)	5.9 (3.5-7.1)	6.4 (3.2-7.7)	4.1 (2.3-5.9)	<0.001
Median best creatinine, mg/dL (IQR)	0.9 (0.7-1.1)	1.1 (0.9-1.4)	1.3 (1.0-1.6)	<0.001
Median HLA mismatches (IQR)	2 (0-3)	2 (0-3)	4 (3-5)	<0.001
Mean cold ischemia time, hours (SD)	13.2 (5.9)	12.1 (5.2)	10.9 (5.9)	<0.001
DGF	35 (35.4)	132 (50%)	117 (53.9%)	0.008
Median Number Dialysis Sessions	0 (0-2)	1 (0-3)	1 (0-4)	0.018

Figure 1: DGF severity by KDPI category:

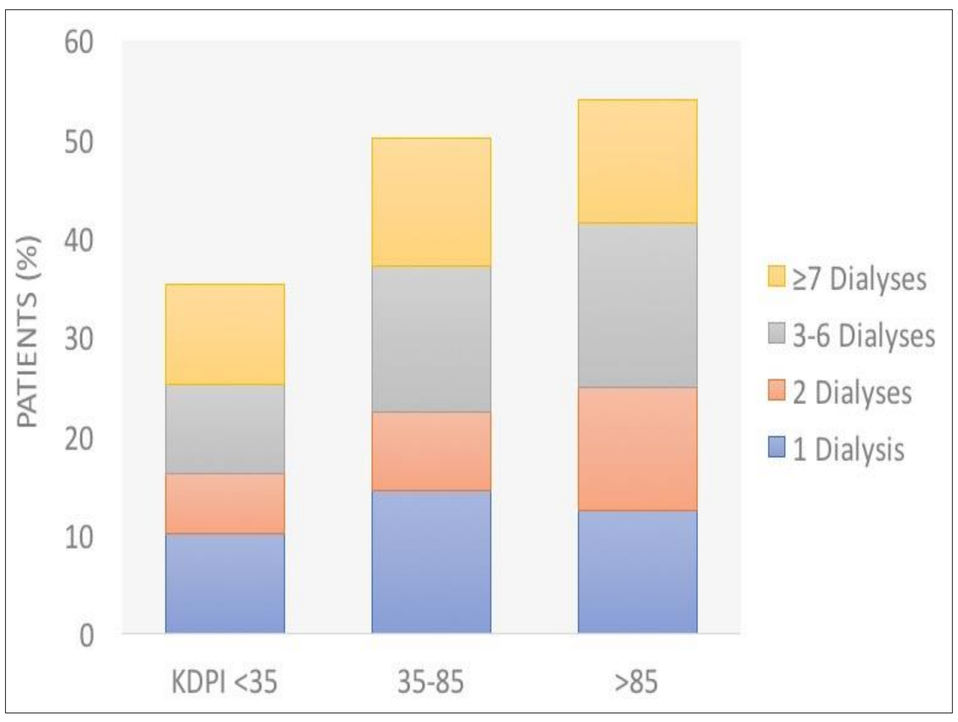
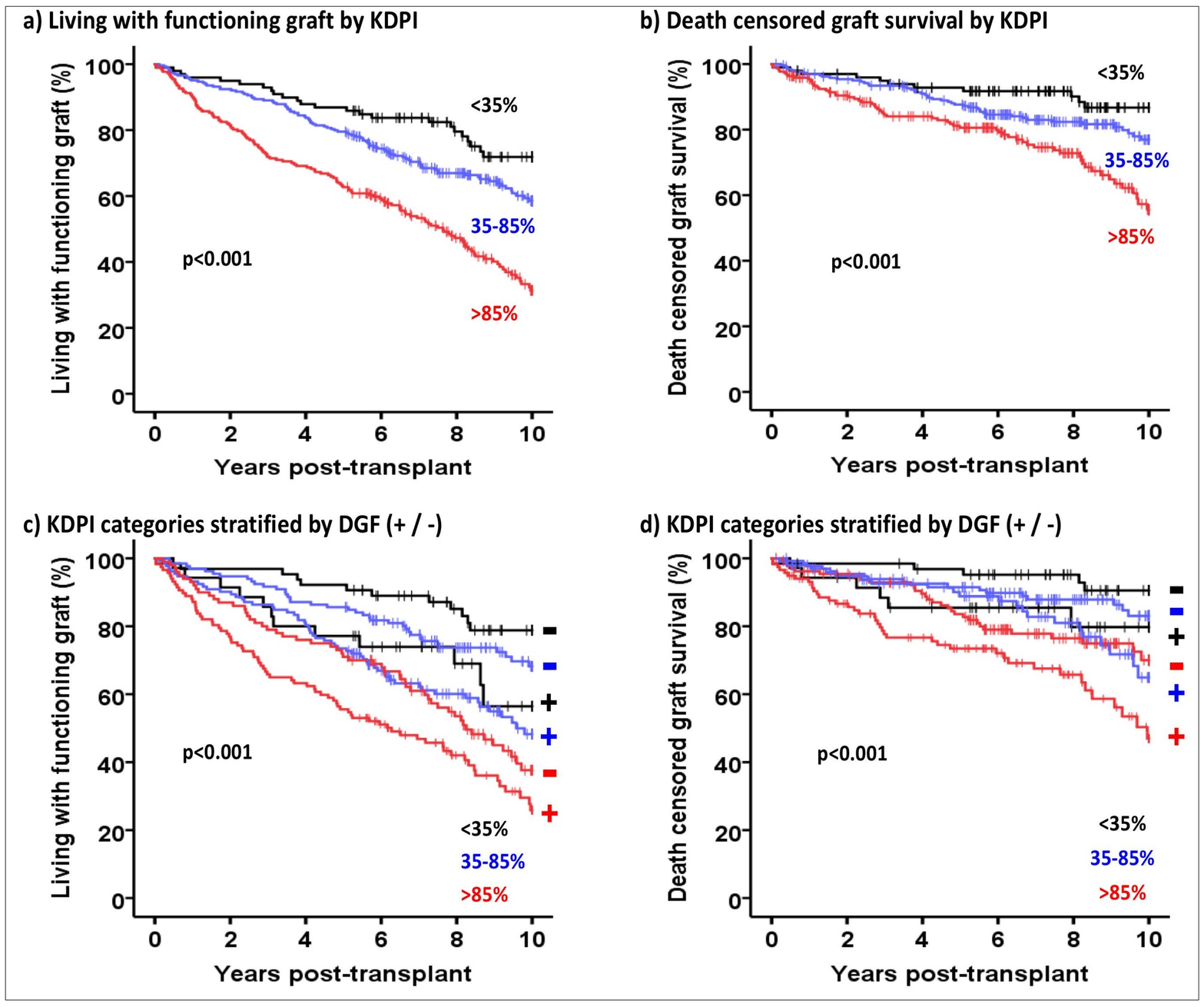


Figure 2:



Conclusions: DGF contributes to further risk for graft loss independently from donor kidney quality assessed by the KDPI and cold ischemia time. Very high KDPI kidneys (>85%) – mostly allocated within the Eurotransplant senior program, facilitating shorter cold ischemia time – achieved comparable rates of DGF to kidneys with a KDPI 35-85%.

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