53rd CONGRESS ERA-EDTA
VIENNA AUSTRIA
MAY 21st-24th, 2016
Held jointly with Österreichische Gesellschaft für Nephrologie

ACUTE KIDNEY INJURY AS DELAYED GRAFT FUNCTION IN DONATION AFTER CIRCULATORY DEATH KIDNEY TRANSPLANTATION: UK SINGLE CENTRE STUDY

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BACKGROUND

Delayed graft function (DGF) is a manifestation of acute kidney injury (AKI) traditionally related to cold ischaemia time, with characteristics unique to the kidney transplant (KT) process. It is defined as the need for dialysis within 7 days of the transplant and is associated with higher incidence of rejection, chronic graft dysfunction and premature graft loss after KT.

Kidney transplantation from Donation after Circulatory Death (DCD) is a model with increased occurrence of DGF compared to Donation after Brain Death (DBD) and living donation (LD). This is likely to be related to the warm ischaemia sustained by the graft. Since the diagnostic criterion of DGF has shortfalls, as dialysis is subjective and a clinician-dependent decision, aim of the study is to assess the whole incidence of AKI, including DGF after KT in different models of ischaemia of the graft (DCD vs. DBD vs. LD) and to evaluate their impact on outcome.

METHODS

This is a retrospective single-centre study of all patients who underwent KT at Queen Elizabeth Hospital Birmingham (2007-2014). We considered: renal function pre-KT, daily within one week post-operatively; characteristics of recipient, donor and graft; patient and graft survival.

AKI and DGF were defined on the basis of KDIGO Guidelines.

RESULTS

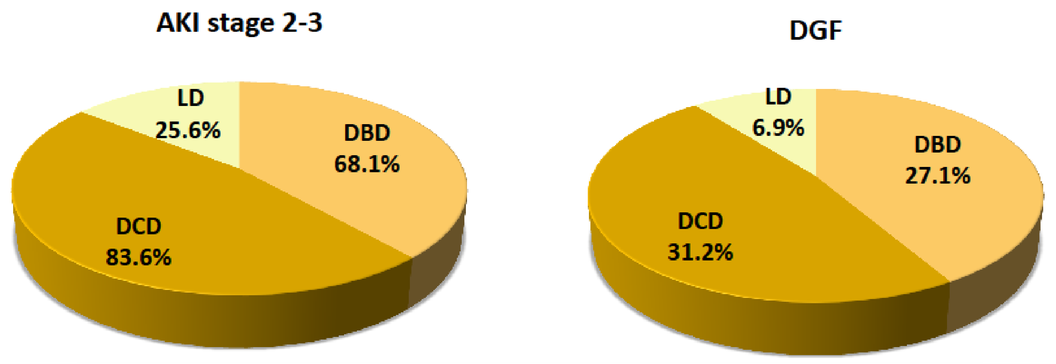
We considered 1126 KT patients (490 DBD, 128 DCD, and 508 LD). Analysis of the demographic and clinical characteristics showed no significant differences between DCD and DBD recipients, whereas there were significant differences between both DCD and DBD compared to LD in median age, race, HBV, HCV (only DBD), serum sodium, serum creatinine, GFR and dialysis (Table 1).

Preliminary analysis showed that DCD recipients had a significantly lower cold ischaemia time (CIT; p=0.0120) and higher incidence of AKI and DGF than DBD (p<0.001); in DBD the CIT had a positive association with the occurrence of DGF (p=0.072). All results about incidence of AKI and DGF are reported in Figure 1.

No significant differences in patient's survival were found between DCD vs. DBD vs. LD.

AKI and DGF had no significant impact on survival.

Figure 1. Incidence of AKI and DGF in DBD vs. DCD vs. LD



	DBD	DCD	LD	*P-value*
AKI stage 2-3	334 (68.1%)	107 (83.6%)	130 (25.6%)	*<0.001*
DGF	133 (27.1%)	40 (31.2%)	35 (6.9%)	*<0.001*

Table 1. Demographic and clinical characteristics between DBD vs. DCD vs. LD

		DBD	DCD	*P-value*	DBD	LD	*P-value*	DCD	LD	*P-value*
N°		**490**	**128**		**490**	**508**		**128**	**508**	
Age		48 (38, 58)	49 (42, 57)	*0.7407*	48 (38, 58)	46 (37.5, 56)	*0.001*	49 (42, 57)	46 (37.5, 56)	*0.0023*
Race	White	311 (63.5)	87 (68.0)	*0.778*	311 (63.5)	412 (81.3)	*0.001*	87 (68.0)	412 (81.3)	*0.002*
	Black	40 (8.2)	9 (7.0)		40 (8.2)	13 (2.6)		9 (7.0)	13 (2.6)	
	Asian	114 (23.3)	28 (21.9)		114 (23.3)	58 (11.4)		28 (21.9)	58 (11.4)	
	Other	22 (4.5)	3 (2.3)		22 (4.5)	21 (4.1)		3 (2.3)	21 (4.1)	
	Unknown	3 (0.6)	1 (0.8)		3 (0.6)	3 (0.6)		1 (0.8)	3 (0.6)	
HBV		27 (5.5)	13 (10.2)	*0.057*	27 (5.5)	16 (3.2)	*0.067*	13 (10.2)	16 (3.2)	*0.001*
HCV		45 (9.2)	10 (7.8)	*0.628*	45 (9.2)	25 (4.9)	*0.009*	10 (7.8)	25 (4.9)	*0.202*
Sodium		139 (137, 141)	139 (137, 140)	*0.2481*	139 (137, 141)	140 (137, 142)	*0.0003*	139 (137, 140)	140(137, 142	*0.004*
Creatinine		7.1 (4.7, 9.2)	7.1 (5.1, 9.2)	*0.3670*	7.1 (4.7, 9.2)	4.6 (3.39, 6.18)	*<0.001*	7.1 (5.1, 9.2)	4.6(3.39, 6.18	*<0.001*
MDRD4		8.41 (6.08, 12.16)	8.14 (5.88, 11.61)	*0.3660*	8.41 (6.08, 12.16)	10.3(7.69, 13.8)	*<0.001*	8.14 (5.88, 11.61)	10.3(7.69, 13.8)	*<0.001*
Dialysis		255 (52.0)	63 (49.2)	*0.569*	255 (52.0)	175 (34.5)	*<0.0001*	63 (49.2)	175 (34.5)	*0.002*

CONCLUSIONS

We demonstrate a higher incidence of post-KT DGF in DCD, despite similar baseline characteristics and a lower CIT, compared to DBD. For the first time we note that DCD recipients suffer a higher incidence of AKI stage 2-3 than DBD and LD. Further analysis should look at the incidence of chronic graft dysfunction and the association between AKI and DGF.

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