THE EFFECT OF COLD ISCHAEMIA TIME (CIT) ON OUTCOMES OF DECEASED DONOR KIDNEY TRANSPLANTS: AN UPDATED UK REGISTRY ANALYSIS

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Introduction

UK transplant centres work hard to implant organs in a timely manner, ensuring the best possible outcomes for transplanted kidneys. Previous UK registry analyses have shown a threshold effect of CIT on donation after circulatory death (DCD) donor kidney transplant outcomes, but it is not clear if, with greater numbers, this effect still holds true.

This study aimed to: 1) **describe trends of CIT over the last decade;** 2) **identify the effect of CIT on outcomes of donation after brain death (DBD) and DCD donor kidney transplants**

Methods

Data were obtained from the UK Transplant Registry on deceased donor adult single kidney-only transplants between 1 January 2000 and 31 December 2017. Machine-perfused kidneys were excluded.

Descriptive, univariate, and multivariable analyses were conducted using SAS Enterprise Guide 7.1.

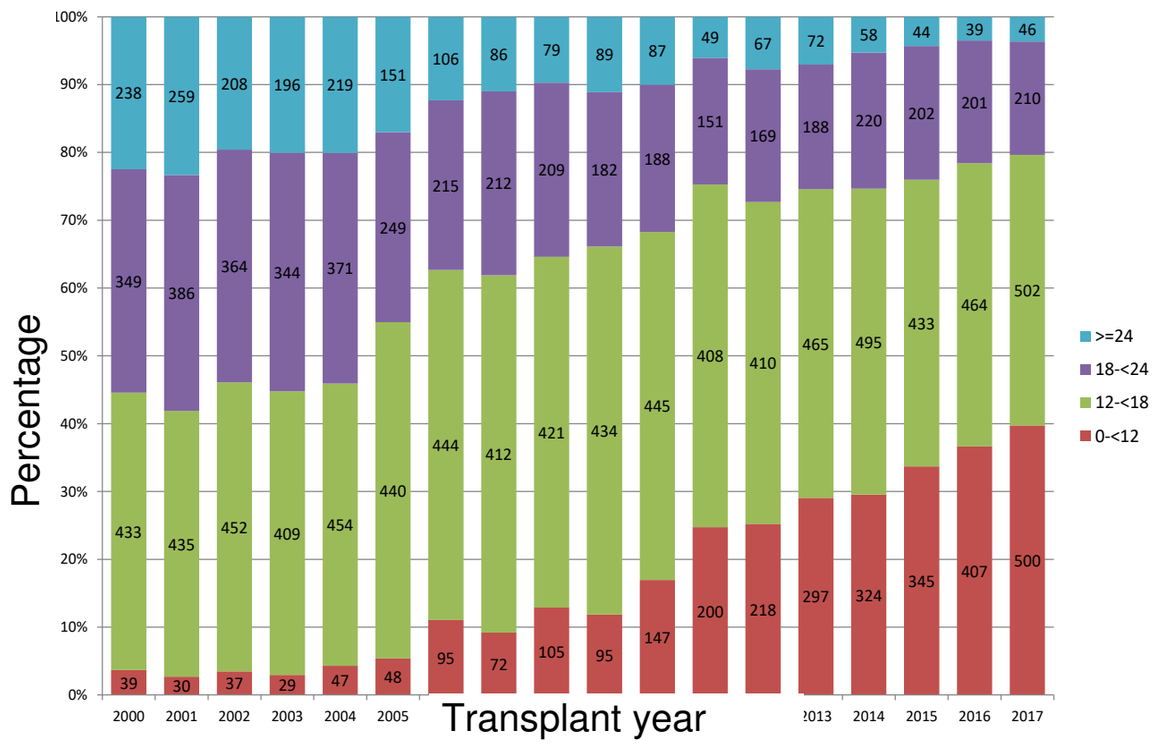
Results

The **CITs of DBD and DCD donor kidney transplants have dramatically reduced** over the study time period, with 80% of DBD transplants now having a CIT of less than 18 hours (Figure 1).

Univariate analysis of **DCD** donor kidney transplants showed a statistically **significant decreasing death-censored graft survival when CITs exceed 12 hours** (p=0.001; Figure 2). Organs with CIT >18 hours have 5-year graft survival of approximately 80%. Prior to 2006, CIT >18 hours was associated with worse graft survival in **DBD** donor kidney transplants, however **no CIT threshold could be identified for the more recent time** period.

This trend remained true when looking at 'lower quality' kidneys only (i.e. the highest quartile of kidneys stratified by UKKDRI (data not shown)), and also when risk factors were adjusted for using a multivariable Cox Proportional Hazards Model (Table 1).

Figure 1. DBD kidney only transplants in the UK by CIT group, 1st January 2010 to 31st December 2017



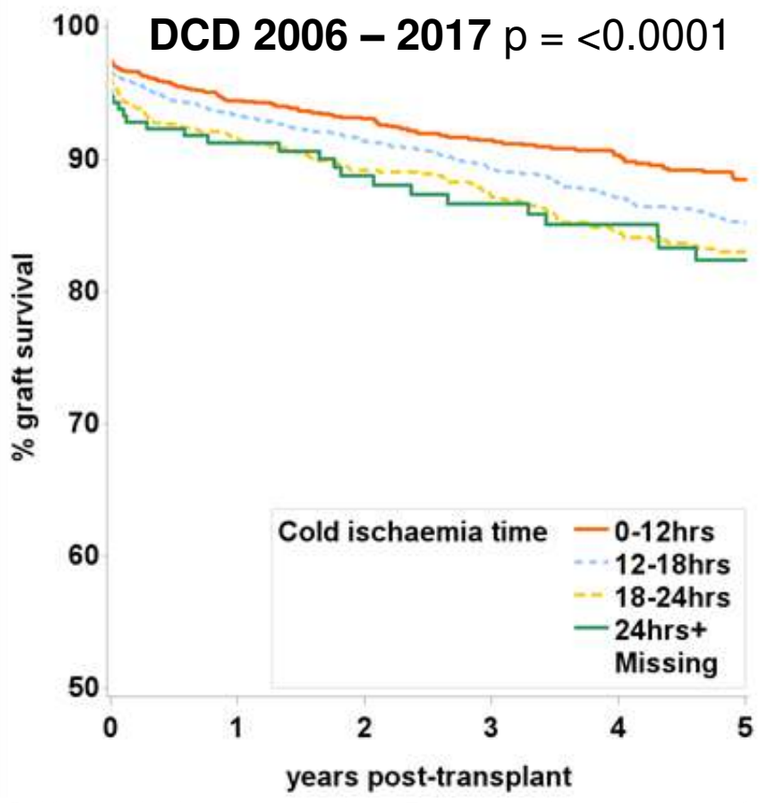


Figure 2. Kaplan-Meier graph to show 5-year death-censored graft survival in DCD kidney transplants by CIT group

Table 1 Cox-proportional hazards model

CIT Group	Hazard Ratio	95% CI	p-value
DBD			
0-<12	1.00	-	-
12-<18	1.04	0.88 – 1.18	0.6
18-<24	1.11	0.91 – 1.30	0.3
24+	1.14	0.90 – 1.43	0.3
DCD			
0-<12	1.00	-	-
12-<18	1.28	1.04 – 1.56	0.02
18-<24	1.63	1.24 – 1.99	0.0002
24+	1.73	1.08 – 2.39	0.02

Adjusted for donor age, donor cause of death, recipient age, waiting time to transplant, primary renal disease, HLA mismatch level, recipient ethnicity, year of transplant

Discussion

Multiple efforts on an individual and organisational level have led to a **reduction in CIT over the last decade in both DBD and DCD donor kidney transplants**. This updated registry analysis confirms previous findings; there is still **a threshold effect of CIT on the graft survival of DCD donor kidney transplants**. The effect of CIT on the graft survival of DBD donor kidney transplants has changed over time. The underlying reasons for this are unclear, at present.

On-going efforts are required to reduce CITs further, especially in DCD donor kidney transplants. This need must be balanced with the requirement to optimise organ utilisation and reduce unnecessary organ discard.

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