

THE INFLUENCE OF COLD ISCHAEMIA TIME ON KIDNEY TRANSPLANT SURVIVAL

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Background: National analyses of the influence of cold ischaemia time (CIT) on kidney transplant outcome have not been possible until now due to incomplete reporting of CIT data. From 2000, CIT has been well reported and validated and this study investigates the effect of CIT on post-transplant survival for recent transplants, adjusting for other known risk factors.

Methods: Data were obtained for 2348 first cadaveric heartbeating donor kidney only transplants in adults in the UK, January 2000 - June 2002. A valid CIT was reported for 2282 (97%). Median CITs for locally retained and exchanged kidneys were compared and the influence of CIT on transplant survival time was investigated. Transplant survival was defined as the time from transplant to transplant failure, this being the earlier of a return to regular dialysis or patient death. Unadjusted survival rates were obtained from Kaplan-Meier estimates and Cox regression models were fitted. The one-year follow-up rate was 96%.

Results: Overall the median CIT was 19 hours (inter-quartile (IQ) range 16-23 hours). Median CIT did not vary significantly between kidneys retained at the retrieval centre (18 hours, IQ range 15-22) and those exchanged with other centres (19 hours, IQ range 16-24 hours). Univariate analysis showed significant differences in one-year transplant survival according to five CIT groups ranging from 90% (95% CI 88-91%) for transplants with CIT<20 hours (n=1273) to 82% (95% CI 75-89%) for transplants with CIT>34 hours (n=115), (p=0.04). Cox regression modelling found a highly statistically significant effect of CIT on outcome having adjusted for donor and recipient age, donor-recipient gender match and HLA match (p<0.0001). Compared with transplants with CIT≤27 hours, the relative risk of transplant failure in the first post-operative year for transplants with CIT over 27 hours was 1.9 (95% CI 1.4-2.5). Analysis of post-transplant epochs showed that the effect influenced transplant survival in the first 3 months, after which time the survival differences remained unchanged.

Conclusion: Complete and accurate CIT data on a national basis confirm that there is a highly statistically significant detrimental effect of long CIT on one-year transplant survival. This is an important finding as CIT is potentially a controllable risk factor: measures should be taken to minimise CIT and improve post-transplant outcome.