

## Donor gender and recipient outcomes after kidney transplantation: a population cohort analysis from the United Kingdom

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Prior studies exploring the effect of donor-recipient gender matching on outcomes after kidney transplant have been inconclusive; hence the topic remains a matter of debate. This may reflect the heterogeneous nature of cohorts analysed and time-varying nature of published studies. In addition, many studies report data from the United States, whose graft outcomes are not comparable to other countries. The aim of this study was to explore the impact of donor-recipient gender matching on kidney transplant outcomes in a population-cohort analysis, utilising contemporary registry data from the United Kingdom.

Our analysis included all patients receiving a kidney transplant between 2000 and 2016 in the United Kingdom (excluding recipients of multiple organs). Data were obtained from the UK Transplant Registry, held by NHS Blood and Transplant, to which every kidney transplant centre within the United Kingdom is mandated to submit demographic and clinical data for each transplant performed. Initially, a range of factors were compared between male and female recipients. The data were divided by recipient gender, and a range of demographic factors and patient outcomes were compared between donor genders. Multivariable analyses were then performed, to assess whether donor gender was a significant independent predictor of recipient outcomes after accounting for confounding factors.

Data were available for a total of 25,140 transplants. Of these, 13,414 (53.4%) of organs were from male donors, and a total of 15,690 (62.4%) recipients were male. Regardless of recipient gender, female donors were found to be significantly older, with lower terminal creatinine, but higher rates of CMV+ serostatus than male donors (all  $p < 0.001$ ). Female donors were more likely to die of intracranial haemorrhage, and less likely to die of trauma than males, resulting in significantly fewer DCD organs originating from female donors. The donor risk index was also found to be significantly lower in female versus male donors. Neither patient nor graft survival were found to differ significantly between donor genders on univariable or multivariable analyses. However, rates of initial graft dysfunction (delayed graft function/primary non-function; DGF/PNF) were significantly lower in female donor organs, with adjusted odds ratios of 0.89 (95% CI: 0.80–0.98,  $p = 0.019$ ) in male recipients and 0.81 (0.71–0.93,  $p = 0.003$ ) in female recipients. Donor gender was also found to be a significant independent predictor of one-year creatinine levels. Male recipients of female donor organs had creatinine levels that were, on average, 6.3% (95% CI: 4.8% - 7.7%,  $p < 0.001$ ) higher than recipients of male donor organs, with a similar difference of 4.1% (95% CI: 2.1% - 6.1%,  $p < 0.001$ ) observed within female recipients.

In our population-cohort analysis of contemporary registry data from the United Kingdom, we found organs from female donors to be associated with reduced risk for DGF/PNF but higher creatinine levels for recipients, regardless of recipient gender. However, donor gender was not found to be significantly associated with patient or graft survival, regardless of recipient gender. Our study provides contemporary data on gender mismatch for recipient counselling and reassurance with regards to equivalent long-term clinical outcomes based upon donor gender.