



Addendum to Living Kidney Donor Guidelines



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United Kingdom Guidelines



Update on the Risks Associated with Living Kidney Donation

Two recent reports have generated discussion about the safety and long term outcome of living donor kidney transplantation.

Muzaale et al reported the long term follow up of 96 217 patients who had donated a kidney in the USA between 1994 and 2011, and compared outcomes to a control group of 20 024 participants in the NHANES III study (1). Median follow up was 7.6 years for kidney donors and 15 years for matched healthy non-donors. 99 patients who donated a kidney developed end stage renal disease (ESRD) at a mean 8.6 years after donation, compared to 36 patients who had not donated a kidney. The estimated risk of developing ESRD was 30.8 per 10 000 patients at 15 years after donation, and 3.9 per 10 000 patients in the control group ($p < 0.001$). The estimated risk was higher in black donors (74.7 vs 22.7, $p < 0.001$). The estimated lifetime risk was 90 per 10 000 donors vs 326 per 10 000 general population vs 14 per 10 000 healthy non-donors.

Mjøen et al reported long term renal function and cardiovascular and all-cause mortality in 1901 patients who had donated a kidney in Norway between 1963 and 2007, and compared the outcomes to 32 621 non-donors who would have been considered for donation over this period (2). Median follow up was 15.1 and 24.9 years respectively. The hazard ratio for all cause death was 1.3 for donors compared to controls, with a hazard ratio 1.4 for cardiovascular death and 11.38 for ESRD. The median time to ESRD among donors was 18.7 years. The crude incidence of ESRD in kidney donors was 302 per million person-years, compared to 100 in the general population. Importantly, among donors, 80% were first degree relatives of the kidney recipient, and only 15% were genetically unrelated. Of the 9 donors who developed ESRD, 7 developed ESRD secondary to immunological causes, and 2 due to diabetes/nephrosclerosis.

A number of methodological concerns have been raised regarding these papers, and both registry data and other analyses with large numbers and long term follow up have shown no increased long term risk of ESRD or death compared to the general population (3,4). However, it appears clear that, for an individual at low baseline risk, donating a kidney increases the risk of later developing ESRD. This is not news, given the low (but real) risk of an individual later developing stone disease, sepsis or cancer affecting the single remaining kidney, and the communication of this risk has long formed part of the consent for organ donation in the UK. However, the magnitude of the increased risk may not previously have been fully appreciated.

It is important to put this increased risk in context. The overall risk of developing ESRD after kidney donation remains very low, occurring in less than one in 200 (0.5%) donors, and it remains much less than that of the general (unscreened) population. Compared to the general public, kidney donors

have equivalent (or better) survival, excellent quality of life, and no increase in ESRD. The increased incidence of kidney failure among living kidney donors is almost exclusively due to genetic and immunological factors, most of which should be screened out by effective donor assessment.

It thus appears that living kidney donation remains a safe and acceptable surgical procedure. The above studies are important, however, in demonstrating that certain groups (e.g. black donors, younger donors, genetically related donors, donors to patients with immunological causes of renal failure, and overweight donors) have a higher risk of ESRD following donation. Taken with other data, they do not alter the conclusion that – for most – the optimal treatment of ESRD remains a living donor transplant, where a suitable living donor is available. However, they should influence practice in three ways:

1. Donor selection. Certain groups appear to be at increased risk of long term complications following kidney donation and these data have implications for donor selection. Thus, for example, young donors are at higher risk, since kidney diseases often start in middle aged people; genetic screening is very important, particularly when a relative has ESRD secondary to immunological disease; non-Caucasian donors have an increased risk of adverse long-term outcome, largely due to socio-economic factors; and obese patients are at higher long term risk of cardiovascular complications.
2. Donor consent. Potential organ donors must be informed of the small long term risks conferred by kidney donation, although these should be placed into the context of the much higher baseline risk of ESRD in the unselected general population.
3. Donor follow up. The data underscore the need for robust follow up of organ donors. While more an issue for the US, where 18% of kidney donors do not have health insurance, this is a significant issue for overseas visitors donating to relatives in the UK, who may have limited resources or access to health care in the longer term.

References

1. Muzaale AD, Massie A, Wang M-C, et al. Risk of end-stage renal disease following live kidney donation. JAMA 2014; 311: 579-86.
2. Mjøen G, Hallan S, Hartmann A, et al. Long-term risks for kidney donors. Kidney Int 2014; 86: 162-7.
3. Ibrahim HN, Foley R, Tan L, et al. Long-term consequences of kidney donation. 2009; 360: 459-69.
4. Najarian JS, Chavers BM, McHugh LE, Matas AJ. 20 years or more of follow-up of living kidney donors. Lancet 1992; 340: 807-10.