Transplant Roundup

The Benefits of a Local Kidney Exchange

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Kidney transplantation is definitive treatment with the best survival rates, quality of life, and cost-effectiveness for patients who have end-stage renal disease (ESRD) (stage 5 chronic kidney disease). However, because of a shortage of available donor organs, only 2.5% of ESRD patients undergo transplantation as their initial treatment.[1] In the United States, 19 patients die each day while awaiting a kidney[2]—the demand for kidney allografts far exceeds the number available from deceased donors. Appropriate referral timing for transplantation is between late stage 4 and early stage 5 chronic kidney disease (estimated glomerular filtration rate, ≤20 mL/min/1.73 m^2).[3]

Live-donor kidney transplantation (LDKT) has become the predominant practice to overcome organ shortages and long waiting times for grafts.[4] Moreover, LDKT is associated with higher patient and graft survival rates than those for deceased-donor transplantation.[5] Current guidelines recommend LDKT for all patients with chronic kidney disease who are eligible for transplantation when a compatible living donor is available.[6] The chief obstacles to LDKT are ABO blood group incompatibility and the presence of human leukocyte antigen (HLA) antibodies in donors; these factors disqualify 57% of otherwise appropriate pairs.[7,8]

Kidney Paired Donation

Kidney paired donation (KPD) involves live-donor paired exchange in which transplant candidates who have no immediately qualified living donor can still receive a kidney. The KPD method, which links candidates with a broad group of living donors, can reveal more than one potential match.[9]

Although KPD was initially proposed in 1986,[10] the first exchange in the U.S. was not performed until 2000.[2] In addition to having all the advantages of LDKT, KPD shortens the time that patients spend on dialysis while awaiting transplantation—the strongest independent modifiable risk factor in renal transplant outcomes.[11] Furthermore, KPD is less costly than debilitating long-term maintenance dialysis and desensitization therapies for ABO- and HLA-incompatible LDKT.[12]

In KPD, organ donations and transplants should be simultaneous, to guarantee recipients a graft and to eliminate the risk that donors might withdraw, and this is logistically challenging when multiple pairs are identified.[13] In comparison with direct LDKTs, the match rate in type O blood group recipients is worse in KPD (22.6% vs 45.6%); conversely, the match rate is better in type B blood group recipients (31.2% vs 12.7%).[14] The discrepancy in the type O group might resolve if national databases for matching were more expansive.[15] Another limitation to national KPD exchange programs is the potential need for out-of-state travel by participants.[14] Local KPD exchange programs shorten cold ischemia time by reducing participants' travel and enabling more efficient evaluation of donors. In Texas, local KPD exchange programs have reported steady increases in transplant volume because of increased awareness and the motivation to find live-donor kidneys for more recipients.[16,17]

The generosity of altruistic, anonymous donors in KPD programs can increase transplant rates beyond those of direct donation.[18] Moreover, optimized matching algorithms for selecting compatible donor–recipient pairs are crucial in maximizing the benefits of KPD programs.[19]

The participation of living donors in local KPD exchange programs is proving to be a valid means of overcoming organ shortages and lengthy waits, increasing accessibility to live-donor transplants, and enabling better donor–recipient matches.

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