

Immunotherapy offers new hope for kidney failure patients with sensitized immune systems



As many as a quarter of all patients with kidney failure have sensitized immune systems — or immune activation against other people — that complicate their ability to receive donor kidneys. Patients who have been exposed to human leukocyte antigens (HLAs) through blood transfusions, pregnancy or previous transplants are more likely to reject a donor kidney because of this previous immune sensitization. With transplanted kidneys lasting an average of about 10 years, kidney transplant recipients are at increased risk of becoming sensitized to subsequent donor organs. Patients who are highly sensitized — especially those with no living donors — often linger at the top of the organ transplant list for years. Sensitization is one important reason the percentage of kidney failure patients waiting two years or more on the organ transplant list grew from 36 to 44 percent between 1998 and 2009.

Kidney failure patients can become sensitized against any of about 100 HLA molecules that are prevalent in varying degrees in the general population. Patients who are sensitized to the most common HLAs are more difficult to match with a compatible donor kidney than those who are sensitized to HLAs that are more rare. Immunotherapy can desensitize patients to the HLA molecule to reduce the risk of organ rejection. Those without living donors can also potentially benefit from immunotherapy because reducing sensitivity to the most common HLAs can improve the chances of a match with a deceased-donor kidney.

Helping highly sensitized patients

Plasmapheresis and intravenous immunoglobulin therapy are two innovative immunotherapies at UCLA that have given new hope to highly sensitized kidney-failure patients who previously had little chance of receiving a donor kidney.

“You can never turn off the immune response completely,” states Gerald Lipshutz, MD, MS, director of the Highly Sensitized and Blood-Group-Incompatible Kidney Transplant Program. “We try to bring the antibody response down enough to allow for the transplant and subsequent graft accommodation, an immunological process that is not completely understood.”

UCLA is one of a few centers in the United States that offers all the components of a world-class kidney-transplant program, including a highly experienced surgical team, expert transplant nephrologists, a sophisticated immunogenetics lab and a plasma-pheresis unit.

“Treating highly sensitized patients is the most difficult challenge we face in transplantation today,” Dr. Lipshutz explains. “But with these therapies and new ones on the way, many more kidney failure patients will be able to benefit from organ transplants.”

Immunotherapy can also help make it possible for patients to receive donor kidneys of a different blood type as one option to circumvent the strong anti-HLA immune response. In addition, UCLA's Living Donor Exchange Program can help provide the best available match and can be combined with immunotherapy to minimize the amount of treatment required to reduce HLA sensitivity.

Two types of immunotherapy

UCLA's Highly Sensitized and Blood-Group-Incompatible Kidney Transplant Program offers two evidence-based immunotherapies that work together to help highly sensitized patients undergo kidney transplants that their immune systems would otherwise reject.

Intravenous Immunoglobulin (IVIg) has been used to treat immune system disorders for many years. Produced from large pools of donated blood plasma processed into immunoglobulin, IVIg contains a multitude of HLA antibodies that can desensitize a recipient to HLA. Some patients need a series of infusions over a period of months to benefit from the therapy.

Plasmapheresis is a blood filtering technique that removes plasma containing HLA proteins from the blood to prevent an immune response. A process that resembles dialysis but is much less taxing on patients, plasmapheresis is typically performed three times a week for one to six months before and sometimes after transplant surgery.

Working with incompatible blood types

Advances in immunotherapy have made it possible for kidney-failure patients to receive donor kidneys of any blood type — an innovation known as ABO-incompatible transplantation. To prepare for an ABO-incompatible transplant, recipients are tested to measure the presence of blood-group antibodies. Before transplant surgery, a recipient undergoes IVIg therapy to help turn off the cells that make blood-group antibodies, and plasmapheresis to remove blood-group antibodies from the blood. The two-pronged approach is generally so successful that two weeks after surgery, most patients who received ABO-blood-type-incompatible kidney transplants have the same medications and treatment regimens as patients who received blood-group-compatible transplants.

UCLA's program helps patients qualify for donor kidneys

UCLA's Highly Sensitized and Blood-Group-Incompatible Kidney Transplant Program gives new hope to patients who previously had little chance of receiving a donor kidney. The program offers patients personalized care that includes direct access to transplant surgeons and experts in pathology, interventional radiology, laparoscopic urology, and immunology and infectious diseases. The team works closely with transplant patients and their referring physicians and serves as an ongoing resource once a patient returns home.

Participating Physicians

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