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The COVID-19 pandemic's effect on solid organ transplantation

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Solid organ transplants—heart, lung, liver, and kidney—are resource-intensive operations that require patients to take immunosuppressive drugs after the procedure to keep the body from rejecting the new organ.

Add a worldwide pandemic to the mix, and the operations become even riskier and more difficult to schedule.

"From the perspective of a transplant surgeon, you don't want to expose your patient to COVID-19 if they are now dependent on immunosuppressants," says Alejandro Suarez-Pierre, MD, a general surgery resident in the Department of Surgery at the University of Colorado School of Medicine. "The other perspective is, as a hospital system, can you keep admitting patients for an operation when you're having to open five or six new intensive care units to take care of the people afflicted by the pandemic?"

Digging into the data

Looking to quantify the effects of the COVID-19 pandemic on solid organ transplants, Suarez-Pierre conducted research that was published in July in the *American Journal of Surgery*. Looking at data from the calendar year 2020, the first year of the pandemic, Suarez-Pierre found that the number of solid organ transplants declined during that time, as did the number of organ donors and waitlist registrations.

Suarez-Pierre and his co-researchers used data from the Organ Procurement and Transplantation Network's Standard Transplant Analysis Research files to model expected transplant rates for 2020 if the pandemic hadn't happened. Those numbers were compared to the actual numbers of transplants performed in 2020, the differences expressed as percentages of the expected numbers.

"We expected 32,000 organ transplants to happen in that year, but we only had 30,000. So that was a deficit of 2,000 transplants, just from the pandemic," Suarez-Pierre says. "That means that overall, we performed 94% of the expected number of transplants."

The effects of time and type

The numbers vary by time of year— April 2020, at the worst point of the pandemic, saw a 25% drop in the number of people added to the waitlist for heart transplants, for instance.

"When you look at the month-by-month data, it looked really drastic," Suarez-Pierre says. "We as the transplant community really feared what this could do to our patients, and patients also feared what this could do to them."

The numbers varied by organ type as well. Kidney (renal) transplants declined significantly, largely because dialysis makes it possible for those patients to wait longer for an operation.

"People who get kidney transplants can wait; they can be on dialysis and not experience any major life events in the way that somebody who needs a liver transplant would," Suarez-Pierre says. "We don't have liver replacement therapy or heart replacement therapy or lung replacement therapy, but we do have renal replacement therapy."

Reasons for the drop

Lung transplants, however, saw the largest drop—20%—leading the researchers to start looking more closely at the numbers to find out exactly what caused the decline—whether it was patient reluctance, doctors' recommendations, or other factors.

"Just looking at the experience of COVID-19 at the University of Colorado School of Medicine, we started reducing the volume of operations based on the kind of operation," Suarez-Pierre says. "For example, we stopped doing elective plastic surgery, because that can

wait, but we didn't stop doing transplants because those patients cannot wait. When the pandemic was at its worst, the only operations we were still doing were transplants and cancer. We expected that these numbers would withstand the pandemic a little better than they actually did."

Suarez-Pierre also plans to look into the transplant data for 2021 and part of 2022, to see if subsequent COVID-19 spikes had—as he hypothesizes—a less severe effect on the number of operations performed.

"We need to keep tabs on this. We need to ensure that we as a medical community got better at prioritizing these patients," he says. "Just saying we did fewer transplants sounds like something that's undesirable, but that just means people died at home. These people don't get to live a long life outside of the hospital if they don't get a transplant. We're reporting a decline in the number of procedures, but these are human lives lost."

More information: Alejandro Suarez-Pierre et al, Measuring the effect of the COVID-19 pandemic on solid organ transplantation, *The American Journal of Surgery* (2021). DOI: 10.1016/j.amjsurg.2021.12.036

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