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EDITORIAL

Risk and reward: Balancing safety and maximizing lung donors during the COVID-19 pandemic

During the early phase of the Coronavirus Disease 2019 (COVID-19) pandemic, there was an abrupt decline in the number of transplants in the United States.[1] The possibility of donor-derived COVID-19 was one of the contributing factors and a consequence of the limited availability of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) donor testing. As solid organ transplant rates have returned to the pre-pandemic time despite the on-going pandemic, the optimal approach to screen solid organ donors for SARS-CoV-2 is uncertain. Ideally, donor screening should minimize the risk of disease transmission and maximize organ utilization.

In this issue, Kaul *et al* report a COVID-19 donor-derived event.[2] The donor died from head trauma. The uniform donor risk assessment interview (UDRAI), used by organ procurement organizations (OPO), did not identify COVID-19 symptoms. A SARS-CoV-2 real-time polymerase chain reaction (RT-PCR) performed in an upper respiratory tract (URT) sample within 48 h of organ recovery was negative; only lungs were transplanted. The recipient unfortunately developed severe COVID-19 and died. The surgeon who prepared the lungs and performed the transplant was also infected. Whole-genome phylogenetic analysis of samples from a donor stored bronchoalveolar lavage, recipient, and surgeon demonstrated the three to be of one origin, proving donor-derived COVID-19 with nosocomial transmission to the surgeon.

Current strategies for screening deceased solid organ donors for SARS-CoV-2 include identification of exposures to and symptoms compatible with COVID-19, and SARS-CoV-2 testing. Adequate deceased donor screening has the dual goal of preventing donor-derived COVID-19 and protecting the transplant and OPO teams. Since April 2020, the Organ Procurement and Transplantation Network (OPTN) reported that all donors are tested for SARS-CoV-2 by at least one modality.[3] From April 2020 to January 2021, a third of lung donors were tested for SARS-CoV-2 in a lower respiratory tract (LRT) by RT-PCR.[4] These data suggest that other lung recipients may be at risk for donor-derived COVID-19.

It was unknown if the donor had exposure to persons known or suspected to be infected with SARS-CoV2. Unfortunately, the UDRAI is limited by the knowledge that the informant has of the donor history, which is often imperfect. The transmission occurred despite a negative SARS-CoV-2 RT-PCR in a URT donor sample. SARS-CoV-2 testing performance depends on the collection technique, duration of illness (with higher false negatives closer to the onset of infection), and specimen type (better performance on LRT samples). Thus, several factors may have contributed to the donor's negative testing and recipient transmission.

Making broad recommendations based on a single case report is challenging, but several issues are presented within this case that merit consideration. An available stored LRT sample was key to the investigation. Lack of routinely stored LRT samples was a barrier in the investigation of other potential donor-derived COVID-19 events.[5] Investigations that include a stored LRT sample may guide future policy. Testing the deceased donor for SARS-CoV-2 in a LRT may have prevented the event. The transplant community should partner with OPOs to overcome the barriers to test lung donors for SARS-CoV-2 in a LRT sample. OPTN policy requires OPOs submit a sputum sample for Gram stain for deceased lung donors; thus, an aliquot could be used. Testing for SARS-CoV-2 in LRT samples is now available.[6] OPOs could validate the assay or collaborate with local laboratories to implement testing and improve turnaround time. Unless LRT testing is available for all OPOs, SARS-CoV-2-uninfected lungs may be discarded, due to the possibility of donor-derived COVID-19. The additive benefit of LRT sample testing will be dependent on the pretest probability of disease and prevalence in the community. The latter is constantly evolving due to herd immunity, emerging SARS-CoV-2 variants, and the proportion of vaccinated people. Studies are required to define the optimal algorithm for lung donor SARS-CoV-2 testing.

OPOs and transplant centers should screen all deceased solid organ donors for SARS-CoV-2 by identifying risk factors and COVID-19 compatible symptoms and testing for SARS-CoV-2 by RT-PCR in a URT sample as close to organ recovery as possible with appropriate sampling technique using validated methods. Likewise, we recommend testing lung donors for SARS-CoV-2, by RT-PCR, in a LRT sample. Until this is universally implemented, lung candidates need to be educated on their risk of mortality on the waitlist and contrasted with the risk of disease transmission when the donor is only tested in the URT. Despite all efforts, the risk of donor-derived COVID-19 is unlikely to be zero. We need to remain mindful that our efforts to prevent donor-derived COVID-19 in lung recipients may lead to lung organ underutilization. OPOs and transplant centers are reminded of the requirement to report all potential donor-derived COVID-19 cases to the OPTN for review as systematic investigation will inform future recommendations.

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