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D. Giannis  
*Northwell Health*

I. A. Ziogas

S. M. Esagian

E. Matenoglou

D. Moris

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# Transplant Immunosuppression Management and COVID-19

Dimitrios Giannis,<sup>1</sup> Ioannis A. Ziogas,<sup>2</sup> Stepan M. Esagian,<sup>3</sup> Evangelia Matenoglou,<sup>4</sup>  
Dimitrios Moris<sup>5</sup>

## Dear Editor:

The novel coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has become a global health care crisis. Immunocompromised patients are often disproportionately affected, although significant regional differences have been observed.<sup>1,2</sup> The Centers for Disease Control and Prevention have listed immunocompromised patients, including those requiring immunosuppression after transplant, as high risk for severe COVID-19. Treatment of other viral infections in transplant recipients often includes a reduction in immunosuppression; however, no recommendations presently exist on the optimal approach in the management of immunosuppression in SARS-CoV-2-infected patients.

It is currently recommended that corticosteroids are avoided for the treatment of SARS-CoV-2 in noncritically ill patients. The effects of COVID-19 on immunosuppressed transplant recipients are still unclear, and reports on the role of immunosuppression and its effect on the course of the disease remain conflicting. Hypothetically, immunosuppression increases the risk of severe infection. However, immunosuppressant medications have been maintained at full doses in many COVID-19-infected kidney transplant recipients without the

occurrence of any adverse events.<sup>3-6</sup> Immunosuppression regimens may have altered the course of COVID-19 disease in these reports. In all cases, the authors attributed these findings to the protective effects of immunosuppression against the overt immune response, the so-called "cytokine storm," which is responsible for the development of severe disease, such as acute respiratory distress syndrome and multiorgan failure.<sup>7</sup> The worse outcomes that are observed may be attributed to the multiple comorbidities of transplant recipients<sup>1</sup> and not to immunosuppression per se.

On the other hand, emerging reports have demonstrated improved outcomes in cases with reduced or halted immunosuppression.<sup>2,8-10</sup> Previous data related to the SARS-CoV-1 and MERS-CoV outbreaks have shown that immunosuppression was not associated with a higher risk of severe disease.<sup>11,12</sup> These reports indicate that we are still in uncharted waters with regard to the management of immunosuppression in SARS-CoV-2-infected transplant recipients. Additionally, this mild initial course of illness raises further concerns because it gives rise to "super-spreading" events, namely, widespread disease transmission through infected asymptomatic individuals. Management of drug-drug interactions between investigational anti-SARS-CoV-2 drugs and immunosuppression may be challenging for clinicians. Adequate immunosuppression is necessary to prevent graft rejection, whereas critically ill SARS-CoV-2-infected transplant recipients may benefit from medications directed at limiting SARS-CoV-2 replication. Maintaining immunosuppressive drug concentrations within the desired therapeutic range requires a highly individualized approach that is complicated by the pandemic context and lack of hindsight. In addition, data from recently published cases, describing the inpatient care of COVID-19 in transplant recipients, differ widely in disease

*From the <sup>1</sup>Institute of Health Innovations and Outcomes Research, Feinstein Institute for Medical Research, Manhasset, New York, USA; the <sup>2</sup>Department of Surgery, Division of Hepatobiliary Surgery and Liver Transplantation, Vanderbilt University Medical Center, Nashville, Tennessee, USA; the <sup>3</sup>Faculty of Medicine, Democritus University of Thrace, Dragana, Alexandroupoulis, Evros, Greece; the <sup>4</sup>Medical School, Aristotle University of Thessaloniki, Thessaloniki, Greece; and the <sup>5</sup>Duke Surgery, Duke University Medical Center, Durham, North Carolina, USA*

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*Corresponding author:* Dimitrios Moris, Duke University Medical Center, 2301 Erwin Rd., 27705 Durham, NC, USA

*E-mail:* dimitrios.moris@duke.edu

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severity, time from transplant, baseline immunosuppression therapy, and the modifications made to immunosuppression during COVID-19 treatment.<sup>13,14</sup>

Finally, there is an ethical component in the decision-making process in all transplant patients that transplant clinicians frequently encounter. It is the golden rule between risk of death and risk of graft rejection. This clinical scenario can emerge in the era of uncertainty around optimal management of immunosuppression and SARS-CoV-2. We advocate for an individualized decision-making approach until definitive guidelines are established, including multidisciplinary discussions among clinicians, with active and informed patient involvement, about the risk of death on immunosuppression, the risk of graft rejection, and the lack of preventive or definitive therapies for COVID-19.

## References

1. Akdur A, Karakaya E, Soy EHA, et al. Coronavirus disease (COVID-19) in kidney and liver transplant patients: a single-center experience. *Exp Clin Transplant*. 2020;18(3):270-274. doi:10.6002/ect.2020.0193
2. Arslan H, Musabak U, Soy EHA, et al. Incidence and immunologic analysis of coronavirus disease (COVID-19) in hemodialysis patients: a single-center experience. *Exp Clin Transplant*. 2020;18(3):275-283. doi:10.6002/ect.2020.0194
3. Wang J, Li X, Cao G, Wu X, Wang Z, Yan T. COVID-19 in a kidney transplant patient. *Eur Urol*. 2020. doi:10.1016/j.eururo.2020.03.036
4. Bussalino E, De Maria A, Russo R, Paoletti E. Immunosuppressive therapy maintenance in a kidney transplant recipient SARS-CoV-2 pneumonia: a case report. *Am J Transplant*. 2020;20(7):1922-1924. doi:10.1111/ajt.15920
5. Seminari E, Colaneri M, Sambo M, et al. SARS Cov2 infection in a renal transplanted patients. A case report. *Am J Transplant*. 2020;20(7):1882-1884. doi:10.1111/ajt.15902
6. Ning L, Liu L, Li W, et al. Novel coronavirus (SARS-CoV-2) infection in a renal transplant recipient: case report. *Am J Transplant*. 2020;20(7):1864-1868. doi:10.1111/ajt.15897
7. Mehta P, McAuley DF, Brown M, Sanchez E, Tattersall RS, Manson JJ. COVID-19: consider cytokine storm syndromes and immunosuppression. *Lancet*. 2020;395(10229):1033-1034. doi:10.1016/S0140-6736(20)30628-0
8. Marx D, Moulin B, Fafi-Kremer S, et al. First case of COVID-19 in a kidney transplant recipient treated with belatacept. *Am J Transplant*. 2020;20(7):1944-1946. doi:10.1111/ajt.15919
9. Bin L, Yangzhong W, Yuanyuan Z, Huiibo S, Fanjun Z, Zhishui C. Successful treatment of severe COVID-19 pneumonia in a liver transplant recipient. *Am J Transplant*. 2020;20(7):1891-1895. doi:10.1111/ajt.15901
10. Zhu L, Xu X, Ma K, et al. Successful recovery of COVID-19 pneumonia in a renal transplant recipient with long-term immunosuppression. *Am J Transplant*. 2020;20(7):1859-1863. doi:10.1111/ajt.15869
11. Stockman LJ, Massoudi MS, Helfand R, et al. Severe acute respiratory syndrome in children. *Pediatr Infect Dis J*. 2007;26(1):68-74. doi:10.1097/01.inf.0000247136.28950.41
12. Hui DS, Azhar EI, Kim YJ, Memish ZA, Oh M-d, Zumla A. Middle East respiratory syndrome coronavirus: risk factors and determinants of primary, household, and nosocomial transmission. *Lancet Infect Dis*. 2018;18(8):e217-e227. doi:10.1016/S1473-3099(18)30127-0
13. Esagian SM, Hayat MH, Giannis D, Ziogas IA, Elias N, Tsoulfas G. Challenges in abdominal organ transplantation during the COVID-19 pandemic. *Front Med (Lausanne)*. 2020;7:287. doi:10.3389/fmed.2020.00287
14. Moris D, Kesseli SJ, Barbas AS. Kidney transplant recipients infected by COVID-19: Review of the initial published experience. *Transpl Infect Dis*. 2020:e13426. doi:10.1111/tid.13426