COVID-19 Reinfection by the Gamma Variant in Kidney Transplant Recipients

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Coronavirus disease 2019 (COVID-19) reinfections were recently reported in the general population,[1] and a few case reports described reinfection in organ transplant recipients.[2,3] We hereby describe 2 cases of COVID-19 reinfections by the gamma (formerly P.1) variant of concern (VOC) in kidney transplant recipients. This variant emerged in the Brazilian Amazon region in November 2020 and rapidly became the dominant strain in Brazil and several other Latin American countries. It is estimated that the gamma variant is 1.7- to 2.4-fold more transmissible than non-P1 lineage and that previous (non-P1 lineage) infections provide 54% to 79% of the protection against the gamma VOC infection. This study was approved by the institutional review board.

Patient 1. A 39-y-old female living in Manaus (Amazon region) received a deceased donor kidney graft 12 y earlier and was immunosuppressed with prednisone, mycophenolic acid (MPA), and tacrolimus. In May 2020, she was admitted to a hospital in Manaus with fever and cough, and the COVID-19 infection was confirmed by real-time polymerase chain reaction (RT-PCR) from a nasopharyngeal swab sample. The clinical course of the disease was mild, MPA was withheld, and she was discharged a week later, asymptomatic with an increment in the serum creatinine from 2.5 to 3.3 mg/dL. In January 2021, she presented with a headache, myalgia, fever, and cough. The chest computed tomography scan showed ground-glass lesions with 30% to 40% lung involvement, and COVID-19 infection was confirmed by RT-PCR. At this time, COVID-19 genotyping revealed the gamma VOC. She recovered within 9 d without complications other than an increment of serum creatinine to 4.0 mg/dL (Figure 1). In April 2021, she received 2 doses of the CoronaVac COVID-19 vaccine.

Patient 2. A 49-y-old male, from the Southern region of Brazil, received a deceased donor kidney graft 6 y earlier and was immunosuppressed with prednisone, MPA, and tacrolimus. In August 2020, he sought emergency treatment complaining of a cough with sputum. The chest x-ray revealed no significant findings, and COVID-19 was diagnosed by an RT-PCR. MPA was withheld, and he was discharged after 2 d. At the end of the quarantine, MPA was reintroduced. In March 2021, he returned to the emergency with a fever and cough and, COVID-19 reinfection was again diagnosed by RT-PCR. At that time genotyping revealed the gamma VOC. A chest computed tomography scan showed lower ground-glass opacities and consolidations in 50% of the lungs, and immunosuppressive drugs were withheld due to clinical deterioration (Figure 1). He recovered after 19 d, and immunosuppression was reintroduced. Graft function remained stable (creatinine 1.4 mg/dL), and he was discharged, receiving the first dose of the AstraZeneca COVID-19 vaccine, in May 2021.

By the end of June 2021, 230 kidney transplant recipient patients in our program were infected with severe acute respiratory syndrome coronavirus 2 and, these 2 patients (0.9%) had reinfections diagnosed. In both cases, the first infection occurred before the emergence of the gamma variant and the second in a period when gamma VOC was highly dominant in Brazil.

Our cases add to the concerns regarding the effectiveness and duration of immunity after COVID-19 infection, higher transmissibility, and immune evasion by VOC.[4] Also concerning is the low antibody response rate observed after SARS-CoV-2 vaccination in transplant recipients reinforced by disease development in fully vaccinated solid organ transplant recipients.[5] Therefore, preventive measures remain crucial to reduce the high mortality rate observed in such patients. Nonetheless, it remains to be clarified if timely

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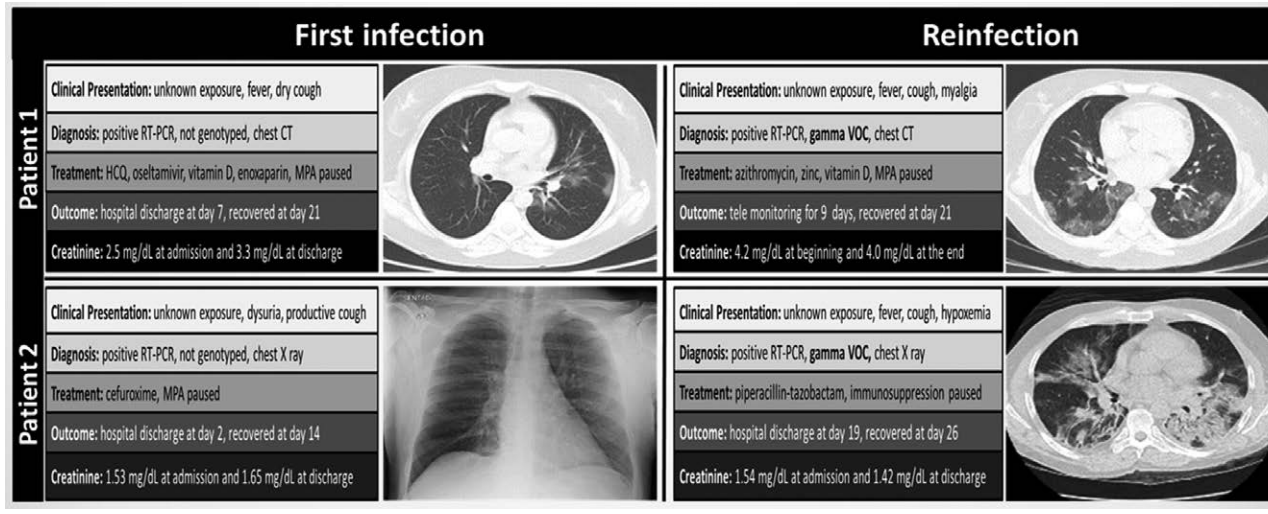

FIGURE 1. Patients 1 and 2. Summary of clinical presentation, radiologic findings, diagnosis, treatment, and outcome in the first and second episodes of coronavirus disease 2019 (COVID-19) infection. CT, computed tomography; HCQ, hydroxychloroquine; MPA, mycophenolic acid; RT-PCR, real-time reverse-transcription polymerase chain reaction; VOC, variant of concern.

successful vaccination may prevent infections or reduce the severity of the disease in this vulnerable population.

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