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CASE ANECDOTES, COMMENTS AND OPINIONS

Paucisymptomatic COVID-19 in lung transplant recipient following two doses of mRNA-1273 (Moderna) vaccine

Tina Marinelli, MBBS, Cecilia Chaparro, MD, Atul Humar, MD, MSc, FRCPC, and Deepali Kumar, MD, MSc, FRCPC

From the Ajmera Transplant Centre, University Health Network, Toronto, Ontario, Canada.

Like most respiratory viral infections, in solid organ transplant (SOT) recipients SARS-CoV-2 infection results in more severe disease compared with non-immunocompromised hosts, with the highest mortality seen in lung transplant (LT) recipients.[1,2] Vaccines against SARS-CoV-2 have proven to be highly immunogenic in non-immunocompromised hosts and have generated hope that widespread vaccination may herald the end of the pandemic. SOT recipients were excluded from SARS-CoV-2 phase 3 vaccine trials, and thus their efficacy in this population has not been established. Early data demonstrate that 46% of SOT recipients did not mount an anti-spike antibody response following two doses of SARS-CoV-2 messenger RNA vaccine.[3] However, the true test of the vaccine is in the yet to be established clinical efficacy in reducing severity of and mortality from COVID-19. We herein describe a case of COVID-19 in a SOT recipient following SARS-CoV-2 vaccination.

The patient, a 56-year-old female, received a bilateral lung transplantation 3.5 years earlier for end-stage lung disease secondary to scleroderma-associated interstitial lung disease. Maintenance immunosuppression was prednisone 10 mg daily, mycophenolate sodium 900 mg twice daily plus cyclosporine 75 mg daily, with a recent trough level of 191.0 μg/L. Her most recent forced expiratory volume in one second was 2.3 litres and forced vital capacity 2.8 litres. She did not experience any episodes of rejection or enhanced immunosuppression within the preceding 12 months. As an employee of a long-term care facility, she received 2 doses of the mRNA-1273 vaccine (Moderna) with a 32-day interval between doses. Nineteen days (day 0) after receiving her second vaccine dose, a routine, asymptomatic nasal swab taken for occupational screening, returned a positive result for SARS-CoV-2 N501Y variant. This was despite vigilant use of personal protective equipment. A screening nasal swab ten days earlier (day-10) was negative for SARS-CoV-2. Thus the patient was likely infected between 9-19 days post-the second vaccine dose, a time at which clinical vaccine efficacy is observed in non-immunocompromised persons.[4] On virtual assessment on day 7, the patient reported only mild fatigue, which she attributed to sleeping poorly due to stress associated with her COVID-19 diagnosis. She did not receive antiviral or immunomodulatory therapy and her immunosuppression regimen was not altered. She remained asymptomatic on second review at day 20.

Although a single case is not robust evidence of vaccine effectiveness, the paucity of symptoms experienced by this patient following 2 doses of mRNA SARS-CoV-2 vaccination is reassuring and contrasts with our experience to date. Of the 23 other LT recipients with COVID-19 managed at our centre, who had not received vaccination against SARS-CoV-2; all were symptomatic at the time of diagnosis; 86.9% ($n = 20$) required hospitalization due to COVID-19; 73.9% ($n = 17$) were hypoxic; 39.1% ($n = 9$) were managed in intensive care; 26.0% ($n = 6$) required invasive mechanical ventilation; 4.3% ($n = 1$) required extra corporeal membrane oxygenation; and 34.8% ($n = 8$) died due to COVID-19. Our experience with COVID-19 in LT in the pre-vaccination era is comparable to that in the reported literature where 88.6% of patients required inpatient admission and 14.3% to 46.0% died.[1,2,5] In our cohort there have been no other cases of asymptomatic SARS-CoV-2 infection diagnosed in a LT recipient on routine screening. Recent data have shown SARS-CoV-2 specific T-cells may be present in some LT recipients despite absence of an antibody response.[6]

We eagerly anticipate further data regarding SARS-CoV-2 vaccination effectiveness in SOT recipients and we strongly recommend vaccination for our transplant recipients despite preliminary data suggesting poor antibody responses.

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