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**CASE REPORT****SARS Cov-2 infection in a renal-transplanted patient: A case report**

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The clinical manifestation of COVID-19 can vary from an asymptomatic course to ARDS requiring invasive mechanical ventilation and extracorporeal membrane oxygenation. A kidney transplanted patient infected with SARS CoV-2 infection showed a mild disease despite immune suppression. It is possible that Immunosuppression can “be protective” as the cytokine storm is an important factor in the disease story. Despite the good outcome reported in the present case report, it remains of vital importance the solid organ transplant patients use precautions in order to avoid the infection.

**KEY WORDS**

clinical research/practice, immunosuppressant – calcineurin inhibitor: tacrolimus, infection and infectious agents – viral, infectious disease

**1 | INTRODUCTION**

A pandemic due to a novel coronavirus, named severe SARS-CoV-2, is ongoing. At the beginning of January, 2020, SARS-CoV-2 has been first identified as the cause of COVID-19 in China and it is now spreading worldwide.

The clinical manifestation of COVID-19 can vary from an asymptomatic course to ARDS requiring invasive mechanical ventilation and extracorporeal membrane oxygenation.<sup>1</sup> Patients at higher risk to develop a severe disease usually suffer from hypertension, cardiovascular diseases, diabetes and malignancy. Roughly, 25% of hospitalized patients need ICU admission, and mortality in this group is around 5%.<sup>2</sup> Patients with solid organ transplant might be at higher risk to develop a severe disease and to have an unfavorable outcome. However, data on these patients are lacking. We report here a case of a kidney-transplanted patient who received a diagnosis of infection due to SARS-CoV-2.

**2 | CASE REPORT**

A 50-year-old man received a kidney transplant in 2016 (a previous kidney transplant was performed in 1993, but the organ was lost due to rejection in 2008) for IGA correlated nephropathy. He suffered from hypertension, treated with amlodipine, and diabetes. His immunosuppressive regimen consisted of tacrolimus and mycophenolate mofetil. On March 4, 2020 he started complaining fever and cough and he was admitted to the emergency room of another hospital Hospital on March 8, 2020. His parameters on admission were a body temperature of 37.3°C, blood pressure 120/80 mm Hg, heart rate 64 bpm. An arterial blood gas analysis showed pH 7.38, pO<sub>2</sub> 79 mm Hg, pCO<sub>2</sub> 31 mm Hg. Blood examination revealed a white blood cells count (WBC) of 3200 × 10<sup>3</sup>/μL, Lymphocytes 600 × 10<sup>3</sup>/μL, lactate dehydrogenase 277 mU/mL. IL6 plasma level on March 16, 2020 was 26.22 pg/mL (normal value 0-3.12). The patient was dismissed home the same day. Due to persistence of fever (around

**Abbreviations:** ARDS, severe acute respiratory distress syndrome; COVID-19, coronavirus disease 19; ICU, intensive care unit; MERS-CoV, Middle East respiratory syndrome CoV; SARS-CoV-2, respiratory syndrome coronavirus 2.

37.5°C) and cough he was admitted to our hospital on March 13, 2020. Nasopharyngeal swab was positive for SARS CoV-2 RT-PCR. Chests x-ray showed minimal interstitial lesions. Laboratory data are reported in Table 1. Since no respiratory symptoms were reported and drug interactions between lopinavir/ritonavir (LPV/r) and patients' daily medications were extensively detected, antivirals and hydroxychloroquine were not administrated. Immunosuppressive therapy was unchanged. Conversely, ceftriaxone was administrated as prophylactic antibiotic coverage. On March 17, 2020 he was discharged home breathing in ambient air and without fever.

### 3 | DISCUSSION

Given to the extent of the SARS-CoV-2 pandemic, solid organ transplant recipients are at risk to contract the disease. Nonetheless, disease course and prognosis in this group are unknown at the moment.

Although viral pneumonia in solid organ transplant patients may present with mild or atypical symptoms at onset, complications occur more frequently than in immunocompetent hosts.<sup>3</sup>

A previous study described the clinical characteristics of two kidney-transplant recipients affected by MERS-CoV infection and reported a variable outcome – death in one case and complete resolution in the other case.<sup>4</sup> The first case was complicated by acute renal failure. Despite a T lymphocyte depletion due to antithymocyte globulin 6 weeks before MERS Cov infection, the second patient had a favorable outcome. As the novel corona virus belongs to the *Betacoronavirus* family, which also contains SARS-CoV and MERS-CoV, it is possible the infections due to these different viruses share some similarities.

At the time of writing, a published report described two heart transplant recipients in China who presented with variable severity of disease (one mild and another with more severe manifestations requiring a prolonged hospitalization). Both patients eventually survived.<sup>5</sup>

Lung viral infections can be associated with ARDS characterized by elevated levels of different cytokines, such as IL 2R, IL 6, and IL

10.<sup>6</sup> The pathogenesis of SARS-CoV-2 infection is as well associated with an immune over-reaction, resulting in a cytokines dysregulated release in particular in those patients who develop this condition.<sup>7</sup>

Patients needing ICU care have higher plasma levels of many innate cytokines, IP-10, MCP-1, MIP-1A, and TNF $\alpha$ . These clinical features suggest that involvement of highly pro-inflammatory condition in the disease progression and severity is likely. In patients with a benign outcome, the symptoms are cleared by the fifth day from onset.<sup>2</sup> The evolution of the disease in the patient described here was favorable, as he was discharged in good clinical conditions after 10 days from symptoms onset. In general 8 days is the main time window between onset of first symptoms and development of ARDS.<sup>2</sup> The IL 6 plasma level at discharge was 26.22 pg/mL, a value below the median level observed in patients requiring high O<sub>2</sub> flow.<sup>8</sup> It can be hypothesized that solid organ transplant patients might be protected by immunosuppressive therapy that might dampen the cytokine storm, is an important factor in the disease story.

Despite the good outcome reported in the present case report, it is of vital importance for solid organ transplant patients to use precautions in order to avoid the infection.

#### DISCLOSURE

The authors of this manuscript have no conflicts of interest to disclose as described by the *American Journal of Transplantation*.

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**TABLE 1** Laboratory parameters

	March 8, 2020	March 13, 2020	March 17, 2020
White blood cell ( $\times 10^3/\mu\text{L}$ )	3530	3200	2880
Neutrophils ( $\times 103/\mu\text{L}$ )	1850	2400	1590
Lymphocytes ( $\times 103/\mu\text{L}$ )	1210	600	890
Monocytes ( $\times 103/\mu\text{L}$ )	640	300	380
Eosinophils ( $\times 103/\mu\text{L}$ )	10	0	0
Creatinine (mg/dL)	1.7	1.65	1.37
C-reactive protein (mg/dL)		1.86	
LDH (mU/mL)	167	277	
ASL (mU/mL)	22		
ALT (mU/mL)	14		62
IL6 (pg/mL)			26.22 <sup>a</sup>

<sup>a</sup>Performed on March 16, 2020.

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#### DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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