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# COVID-19 in a Kidney Transplant Patient

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The world is currently experiencing an outbreak of a novel viral pneumonia known as 2019 novel coronavirus disease (COVID-19). To the best of our knowledge, there have been no reports on kidney transplant patients with COVID-19 to date.

In January 2020, a renal transplant patient with COVID-19 was admitted to the First Hospital of Zhoukou, Zhoukou, China. Written informed consent was obtained from the patient and the study was approved by the ethics committee of the local hospital.

The patient was a 49-yr-old male kidney transplant recipient who developed fever and respiratory symptoms between February 6 and February 12, 2020 and was admitted to the hospital on February 13, 2020. His history included close contact with a confirmed COVID-19 case. Chest computed tomography showed multifocal ground-glass opacities, and real-time reverse transcriptase polymerase chain reaction tests on pharyngeal swabs were positive for COVID-19 on February 13, 2020. The patient had a reduced lymphocyte count and elevated C-reactive protein levels (Table 1). He had received a kidney graft 2 yr previously and has been on triple immunosuppressive therapy with cyclosporine A (CsA, 100 mg twice daily, orally), mycophenolate mofetil (0.75 g twice daily, orally), and prednisone (4 mg once daily, orally) since the surgery. His medical history also included type 2 diabetes for 20 yr and hypertension for 10 yr.

The patient was admitted to the special isolation ward and underwent comprehensive treatment for COVID-19, including supplemental oxygen through nasal catheters, lopinavir plus ritonavir (500 mg twice daily, orally), ribavirin (0.5 g twice daily, intravenously), interferon α-2b (50 μg twice daily, atomization inhalation), and methylprednisolone (40 mg once daily, intravenously). The patient was maintained on immunosuppression with CsA, mycophenolate mofetil, and prednisone throughout the course of his treatment.

He became afebrile on February 15 (day 10 of illness) and a dry cough persisted until day 12 of illness. His respiratory status was stable without supplemental oxygen inhalation, and he had stable renal function. His nasopharyngeal swabs were negative on day 14 of illness, and the patient remained well during follow-up.

To the best of our knowledge, we report the first case of COVID-19 in a renal transplant patient who was maintained on conventional-dose immunosuppression throughout the course of his treatment. Organ transplant patients with COVID-19 infection might have poorer prognosis because of their systemic immunosuppressive state. However, this severe case was cured even without discontinuing or reducing his immunosuppressant therapy. There are two possible reasons that might help to explain this result. First, it has been reported that overwhelming inflammation and cytokine release could lead to multiple organ dysfunction and death in patients with COVID-19 [1]. However, his immunosuppressive state could have protected this kidney transplant patient from severe immune injury. Second, as a potent immunosuppressive agent, CsA is able to inhibit the replication of diverse coronaviruses, including severe acute respiratory syndrome coronavirus, Middle East respiratory syndrome coronavirus, human coronavirus NL63, and feline coronavirus [2,3]. Whether CsA has an antiviral effect for the coronavirus causing COVID-19 requires further study.

This immunosuppressed case might help physicians to establish optimal treatment strategies for similar severe . cases.

***Conflicts of interest:*** The authors have nothing to disclose

**Table 1 – Summary of laboratory test results for the patient with COVID-19.**

| | Reference range | Day 8 of illness | Day 12 of illness |
|---|---|---|---|
| White blood cell count ($\times 10^9$ /l) | 4–10 | 7.18 | 6.32 |
| Neutrophils ($\times 10^9$/l) | 2–7 | 6.06 | 5.64 |
| Neutrophil ratio (%) | 50–70 | 84.4 | 89.2 |
| Lymphocytes ($\times 10^9$/l) | 0.80–4 | 0.59 | 0.64 |
| Lymphocyte ratio (%) | 20–40 | 8.2 | 7.3 |
| C-reactive protein (mg/l) | <10 | 22.73 | 7.8 |
| Procalcitonin (ng/mL) | 0–0.5 | 0.36 | 0.38 |
| Serum creatinine (μmol/l) | 21.5–104 | 128.1 | 101 |
| Blood urea nitrogen (μmol/l) | 2.82–8.2 | 7.17 | 7.93 |

## References

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