CASE REPORT
Transplantation

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COVID-19 with a Fatal Outcome in a Kidney Transplant Recipient: Case Report

Renal Transplant Hastasında Fatal COVID-19: Olgu Sunumu

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Abstract

Coronavirus disease 2019 (COVID-19) has become a pandemic, with a mortality of up to 10% in the general population. Comorbidities such as diabetes and hypertension are common among the elderly. The clinical manifestations of viral pneumonia associated with COVID19 vary widely, from mild to severe, in patients who underwent solid organ transplantation, an immunosuppressed patient group. Further large-scale studies regarding the screening and treatment approaches for COVID-19 among patients undergoing transplantation are required. Herein, we report the case of a patient who underwent renal transplantation and developed the COVID-19 infection that resulted in mortality.
Keywords: SARS-CoV-2 infection, COVID-19, Immunosuppression, Kidney transplantation, Treatment

Öz

Koronavirüs hastalığı (COVID-19) günümüzde pandemik enfeksiyon olarak görülmekte ve genel popülasyonda mortalite oranı %3'lere ulaşmaktadır. Diyabet, hipertansiyon gibi eşlik eden komorbiditeler ve yaşlılarda daha fazla görülmektedir. İmmünosüpresif hasta grubu olan solid organ tranplantı olan hastalarda COVID-19'a bağlı gelişen viral pnömoni seyri hafif seyirden ağır seyre geniş yelpaze göstermektedir. Nakil hastalarında COVID-19 tarama ve tedavi yaklaşımları titizlikle değerlendirilmeli, geniş serilerle dokümente edilmelidir. Biz bu olgu sunumunda böbrek nakli olmuş mortaliteyle sonuçlanan COVID-19 olgusunu sunmayı amaçladık.
Anahtar Kelimeler: SARS-CoV-2 enfeksiyonu, COVID-19, İmmünosüpresyon, Böbrek nakli, Tedavi

Introduction

The first case of infection from the novel coronavirus, SARS-CoV-2, named Coronavirus disease 2019 (COVID-19), was identified in Wuhan, China, in December 2019 and has become a pandemic; the COVID-19 infection is characterized by respiratory disease (1). COVID-19 has been reported to have a higher fatality rate and a more severe clinical course than other viral respiratory diseases, particularly in the elderly and those with comorbidities (2). Although patients can be asymptomatic or present either mild flu-like symptoms or severe upper respiratory tract infection, cases of severe viral pneumonia with respiratory failure have been encountered (3-5).

Severe clinical conditions have been reported in solid organ transplant (SOT) recipients owing to immunosuppression, and chronic immunosuppression has been shown to be a highly comorbid condition. Varying clinical results have been reported from China, Italy, and France for COVID-19 in SOT recipients on different immunosuppressive modalities (6-10). We aimed to present a fatal case of COVID-19 in kidney transplant recipient.

Case Report

A 47-year-old man who had undergone living-donor kidney transplantation at another hospital 8 years ago, presented to a health center with the complaints of fever, malaise, and cough, where COVID-19 was suspected and laboratory and thoracic computed tomography (CT) examinations were performed. The patient was referred to our clinic, which is a pandemic and organ transplantation center. The patient had fever (38.7

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°C), malaise, and cough on presentation. Lung examination revealed bilateral diffuse coarse rales. His O2 saturation was 92%, heart rate was 125/min, and respiratory rate was 24/min. The immunosuppression protocol of the patient was as follows: sirolimus (Rapamune) 2 × 1 mg, mycophenolate mofetil (MMF) 2 × 500 mg, and steroid 1 × 5 mg. In addition, he was administered amlodipine 10 mg as an antihypertensive. His medical records showed that he primarily had renal amyloidosis because of familial Mediterranean fever. The patient was followed-up at our clinic 1 month prior, when he had a creatinine level of 2.67 ng/mL, and the graft biopsy performed approximately 1 year ago presented signs of chronic allograft nephropathy.

On hospitalization day 1, the patient's creatinine, C-reactive protein, and procalcitonin levels were 3.57 ng/mL, 70 mg/L, and 0.14 ng/mL, respectively, and his leukocyte and absolute lymphocyte counts were 5700/µL and 1000/µL. His sirolimus level was 7.5 ng/mL.

Thoracic CT showed involvement consistent with bilateral diffuse viral pneumonia (Figure 1).

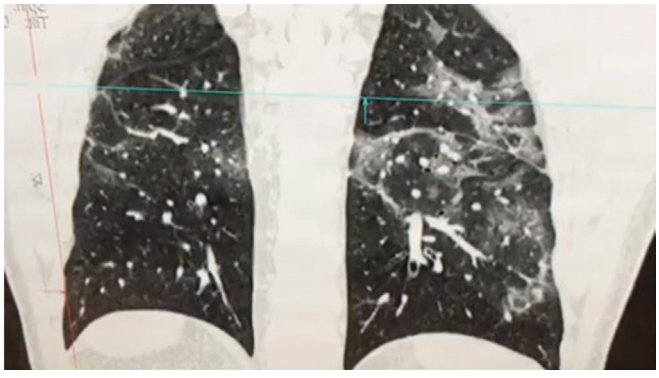

Figure 1. Thorax CT when symptoms appear. Bilateral lung involvement due to viral pneumonia

According to the COVID-19 Treatment Protocol of the Ministry of Health, the patient was initiated on oseltamivir 2 × 75 mg, hydroxychloroquine 2 × 200 mg, and azithromycin 1 × 500 mg. On the third day of treatment, he developed severe respiratory distress, with decreased O2 saturation of 83%. He was transferred to the intensive care unit, wherein he was intubated. We halved the MMF dose, and initiated favipiravir 2 × 600 mg; however, on hospitalization day 9, the patient died. Table 1 summarizes the patient's laboratory examination results, clinical course, and treatment details.

The patient's PCR tests on hospitalization days 1 and 3 were negative for COVID-19. However, a PCR test conducted with the bronchoalveolar lavage sample collected from the endotracheal tube on hospitalization day 5 was positive for COVID-19.

Table 1. Demographic data, clinical manifestations, treatment choices, and the clinical course of the patient

	Case
Patient age, years	47
Time post-trasplant, years	8
Primary pathology	Renal amiloidosis
Medical history	
İmmunsupressive medications	Sirolimus (target level 5-12 ng/mL), mycophenolate mofetil, steroid
Fever	Documented
Symptoms	Fatigue, cough, and dyspnea
White blood cell count (cells/µL)	Illness day 1: 6700 Illness day 2: 12900 Illness day 3: 2600
Absolute lymphocyte count (cells/µL)	Illness day 1: 1000 Illness day 5: 400 Illness day 9: 700
D-dimer level (ng/mL)	Illness day 1: 698 Illness day 5: 2128 Illness day 9: 5228
Creatinine level (mg/dL)	Illness day 1: 3.06 Illness day 5: 3.2 Illness day 9: 2.78
SARS-CoV-2 PCR results	Illness day 1: Negative Illness day 3: Negative Illness day 5: Positive
CT	Bilateral diffuse involvement
Intubation	Yes
Antiviral management	Oseltamivir, hydroxychloroquine, favipiravir
Outcome	Exitus, day 9

PCR: Polymerase chain reaction, SARS-CoV-2: Severe acute respiratory syndrome coronavirus 2

Discussion

The clinical course of our patient, who was an SOT recipient and contracted COVID-19, deteriorated rapidly, leading to mortality.

While COVID-19 pneumonia may not manifest typically a severe infection, it could lead to severe infection or even mortality in immunosuppressed patients, as in our case (11).

The study by Aslam and Mehra (12) that included 2 heart transplant recipients with COVID-19 reported the death of 1 patients because of severe pneumonia.

A study from China reported the different clinical courses of 2 heart transplant recipients with COVID-19, with 1 requiring prolonged hospitalization (39 days); however, both patients recovered (12).

Several case reports of SOT recipients contracting COVID-19 continue to be reported globally, with presentations ranging from mild to severe (13).

Although viral infections are known to have a fatal course in transplant patients, age, sex, and comorbidities are important predictor of the course of COVID-19 in these patients. In addition to immunosuppression, hypertension and chronic allograft nephropathy were likely significant comorbidities in our patient; however, as is shown in the study by Liu et al. (14), lymphopenia and increased D-dimer levels from admission to death were important indicators of the poor clinical course.

Conclusion

In conclusion, we present a case of COVID-19 in a renal transplant recipient that resulted in mortality. However, several reports of mild infection in SOT recipients with COVID-19 exist. Hence, larger-scale studies are needed to conclusively determine the risk factors. The clinical of COVID-19 could be unpredictable in immunocompromised patients and hence, it should be tested for in all transplant patients.

Ethics

Peer-review: Externally peer-reviewed.

Conflict of Interest: No conflict of interest was declared by the authors.

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