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Case Report

COVID-19 in a bone marrow transplant patient

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ABSTRACT

Coronavirus disease 2019 (COVID-19) has become a new pandemic with over 190000 cases and 7800 death reported world-wide as of 18 March 2020. Due to its high infectivity and pathogenicity, most people are vulnerable to this virus, especially those with comorbidities. According to a previous study, patients with pre-existing conditions are more likely to require mechanical ventilation, which may lead to a higher risk of death. Post-transplant patients are usually under immunosuppressive therapy; this immune deficiency status may result in opportunistic infections. For now the experience in the management of COVID-19 in the post-transplant population is limited. Here we report COVID-19 case who just underwent transplantation and did not show any disease activity, despite of his suppressed immune status.

Keywords: Coronavirus, Mechanical ventilation, COVID-19

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus was declared a pandemic on 9 March by the World Health Organization (WHO). A hallmark of COVID-19 management is supportive care, and there is still no convincing evidence for a treatment that will reduce mortality. Severe COVID-19-associated sepsis characterized by acute respiratory distress syndrome (ARDS), secondary bacterial pneumonia, thrombotic complications, myocarditis, and gastrointestinal involvement is more prevalent in those with comorbidities, such as hypertension, diabetes, cardiac disease, cancer, and >70 years old. There is a paucity of data on COVID-19's impact on bone marrow transplant patients. A case series of seven hematopoietic stem cell transplant recipients at Birmingham Heartlands Hospital diagnosed with SARS-CoV-2 reported a mortality rate of 28% directly attributed to COVID-19, with two out of three patients who had chest infiltrates on computed tomography and X-ray imaging progressing to acute respiratory distress syndrome (ARDS).[1]

Also, two case reports were published in the Bone Marrow Transplant Journal, where pediatric patients received hematopoietic stem cell transplants and were heavily immunosuppressed but had a benign clinical course of COVID-19.[2] Here, we report the case of a patient who received a bone marrow transplant at KFSH and RC Hospital who have been found positive for COVID-19 by real-time polymerase chain reaction (RT-PCR) from nasopharyngeal swabs 7 days post bone marrow transplant.

CASE REPORT

Mr. Abdelaziz is a 21-year-old gentleman who has acute lymphoblastic leukemia/chronic myeloid leukemia with a blastic crisis of extramedullary lymphadenopathy. He received chemotherapy, then underwent peripheral blood haploidentical stem cell bone marrow transplant on 19 June 2020. Unfortunately, the post-transplant screening COVID-19 test for the patient came back positive; his father (the donor), was diagnosed with COVID-19 after being discharged from the hospital. On 26 June, the patient was shifted to the intensive care unit (ICU) for

observation. Throughout his ICU stay, the patient's clinical status remained stable, and his CXR remained normal, with no signs of respiratory distress and breathing normally on room air. The post-transplant patient received cyclosporine as planned by the hematology team and remained severely pancytopenic.

The patient's ferritin level was elevated (above 3000), which is not a common finding post stem cell transplant, and when it does occur, it tends to be later than detected in our case. Thus, it might be the only markers, and predictor for an impending COVID-19 induced cytokine storm, especially given that the patient's ferritin level was 600 prior to his transplant. After a multidisciplinary meeting with hematology and ID, we started him on tocilizumab, but his ferritin level continued to increase, reaching its maximum of 83,000 on 11 July. This might be related to transplant/HLH as the patient did not show any signs of COVID disease activity, remained clinically stable, and was discharged from the ICU to the floor on 3 July. A follow-up chest CT was done on the floor, which showed bilateral patchy subpleural and peribronchovascular ground-glass densities predominately involving the lower lobes changes, which is consistent with COVID-19 pneumonia. The patient was discharged on 22 July as his inflammatory markers decreased, and his COVID PCR result was negative.

DISCUSSION

Despite the previous case seriesthat was done in Birmingham Heartlands Hospital and sows high mortality rate.[1] Mr.abdelaziz didn't shows any signs of disease activity.[1] Our patient had just undergone a stem cell transplant after myeloablative chemotherapy, so his immune status will have been low. Thus, given that most severe cases of COVID-19 are driven by an intense immune reactivation and cytokine storm, our patient would not have been expected to show this early in his disease as all T and B cells are depleted. The timeline of disease severity we usually see in the normal host will also be shifted to later when this patient starts the engraftment phase. Despite all of that, this patient did not show any disease activity while following up the patient in the clinic, even after engraftment, and all his cytokines trended down to near normal values.

CONCLUSION

It is reasonable to speculate that immunosuppression and the lack of an immune response might avoid the most severe forms of the disease, although this conclusion cannot be definitive. The proper understanding of COVID-19 in patients under cancer treatment and immunosuppressive drugs depends on prospective and collaborative efforts.

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