Recovery from COVID-19 in a recent Heart Transplant Patient
A Case Report

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Case Diagnosis

This report details the case of a 61-year-old man with a history of recent heart transplant, who presented to acute rehabilitation after a three-month hospitalization for coronavirus disease 2019 (COVID-19). His acute medical stay was complicated by multi-system organ failure and several other complications, including central line infection, acute transplant rejection, and a large stage IV sacral pressure ulcer.

Introduction

In the spring of 2020, New York City and the surrounding areas became the epicenter of the COVID-19 pandemic, as there were over 315,000 cumulative cases and over 24,000 deaths in the state by May 1st.[1] Of those who required intensive critical care and survived, many needed rehabilitation services to assess and treat long-term sequelae in the physical, cognitive, and psychosocial realms.[2]

One of the well-known risk factors for severe COVID-19 is immune suppression, which predisposes the body to more severe infections. However, many sequelae of COVID-19 are thought to be secondary to the host inflammatory response rather than directly from the virus (Figure 2), and preliminary studies showed that in heart transplant patients, the use of immunomodulatory therapy might lessen the severity of this inflammatory phase.[3]

Case Description

The patient had a medical history of chronic obstructive pulmonary disease (COPD), hypertension, and benign prostatic hyperplasia (BPH), in addition to a recent heart transplant. During his acute inpatient hospital stay, he was treated with COVID-19 convalescent plasma and intubated due to hypoxic respiratory failure (Fig 1), followed by tracheostomy placement for the following five weeks. While on respiratory support, he was found to be in acute transplant rejection and was treated with increased doses of prednisone and mycophenolate. He also had ventilator-associated pneumonia and central line-associated VRE bacteremia, and a stage IV pressure ulcer on his sacrum which measured 8x7 cm.

The patient presented to rehabilitation with deficits in gait and performing his activities of daily living, likely due to debility from prolonged acute hospitalization with COVID-19, and residual weakness in his left upper extremity.

Throughout his rehabilitation stay, the care team had to ensure that his complex care needs were coordinated with his transplant team. This included communications regarding tacrolimus blood levels, continued antibiotic therapy to eradicate nosocomial infections, and scheduling a myocardial biopsy after discharge.

Figures

Figure 1: Patient X-ray during COVID infection

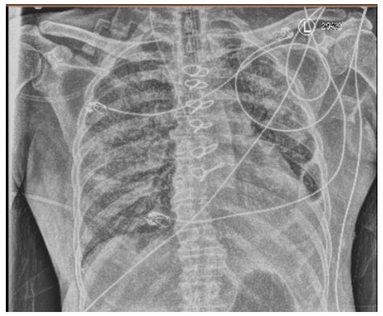
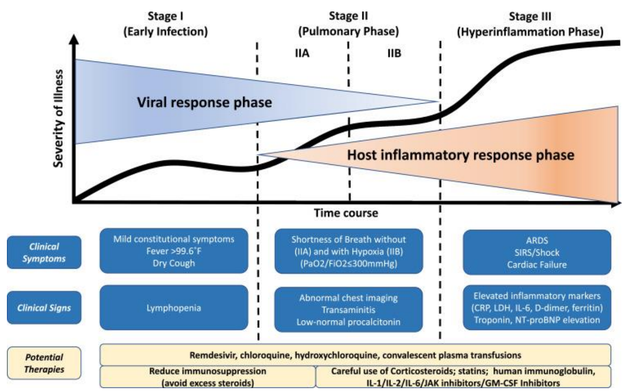


Figure 2: The immune system and COVID-19[3]



Discussion

Although the patient had a prolonged hospital course with extensive complications, his rehabilitation course was relatively un-complicated, and many of his complications were likely due to prolonged hospital stay, critical illness, and recent heart transplant rather than directly from COVID-19. He was able to complete an 18-day acute rehabilitation hospital course and met his goals for safe discharge to home with assistance from home care and with a wound vac in place around his pressure ulcer.

Conclusions

Rehabilitation of patients from COVID-19 acute hospitalization is a challenging new aspect of physiatry, as medical complications and residual deficits can vary widely, and unique challenges such as transplant management can make coordinating care difficult. In these cases, it is important to work closely with care team members and outside transplant providers regularly to optimize care as the patient recovers from a long hospital course with critical illness. More research needs to be conducted analyzing the severity of the inflammatory response in patients with COVID-19 who are concurrently undergoing treatment with immunomodulatory therapies, and how it impacts long-term sequelae.

References

[1] New York. (n.d.). Retrieved January 25, 2021, from https://www.worldometers.info/coronavirus/usa/new-york/

[2] Simpson, Robert PhD, MBChB; Robinson, Larry MD Rehabilitation After Critical Illness in People With COVID-19 Infection, American Journal of Physical Medicine & Rehabilitation: June 2020 - Volume 99 - Issue 6 - p 470-474

[3] Siddiqi, H. K., & Mehra, M. R. (2020). COVID-19 illness in native and immunosuppressed states: a clinical–therapeutic staging proposal. *The Journal of Heart and Lung Transplantation*, *39*(5), 405