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COVID-19 INDUCED CARDIOMYOPATHY SUCCESSFULLY TREATED WITH TOCILIZUMAB

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Background: It is now reported in the literature that the SARS-COV2 (COVID-19) can induce myocardial injury by either exaggerated inflammatory response or direct myocardial invasion. We present a case of COVID-19 induced cardiomyopathy that was reversed by the administration of corticosteroids and tocilizumab.

Case: A 39-year-old female with well controlled systemic hypertension, tested positive for SARS-CoV-2 PCR test and underwent self-isolation for 10 days. Patient presented a month later with a three-day history of progressively worsening generalized body aches, chills, fever, watery diarrhea, dry cough, mild shortness of breath, and nonspecific chest pain. Electrocardiogram (ECG) showed sinus tachycardia. Laboratory studies demonstrated positive SARS-CoV-2 RNA PCR; Troponin-I 4.295 ng/mL, BNP 2,291 (pg/mL), inflammatory markers including lactate dehydrogenase (LDH), ferritin, C-reactive protein, procalcitonin, and IL-6 were also elevated. Transthoracic echocardiogram revealed left ventricular ejection fraction (LVEF) of 20-25%. She received tocilizumab, dexamethasone, and furosemide. Seven days after treatment initiation, repeat transthoracic echocardiogram demonstrated interval improvement with LVEF to 50-55%. Patient was successfully discharged home on hospital day 9. She was seen in cardiology outpatient clinic a week later and in medicine clinic 2 weeks later and she is in excellent health.

Decision-making: A multidisciplinary team including infectious disease and cardiology devised a plan to start on tocilizumab and dexamethasone. Tocilizumab is an IL-6 inhibitor that has been FDA approved for chimeric antigen receptor(CAR) T cell-induced cytokine release syndrome (CRS), and has shown promise in the treatment of COVID-19 associated acute coronary syndrome. We also relied on evidence-based strategies used to overcome cytokine storm caused by CAR therapy by increasing doses of corticosteroids.

Conclusion: This patient’s prompt response to tocilizumab and corticosteroids seems to support the underlying hypothesis that cytokine storm is the primary mechanism by which COVID-19 induces cardiomyopathy and myocardial stunning.