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Coronavirus Associated Fulminant Myocarditis Successfully Treated With Intravenous Immunoglobulin and Extracorporeal Membrane Oxygenation

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Abstract

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INTRODUCTION: Myocarditis is a rare complication of many viral syndromes. Most commonly described viral etiologies are adenovirus, coxsackievirus, CMV, HIV, and parvovirus B-19. We present a rare case of coronavirus related fulminant myocarditis.

CASE PRESENTATION: Nine month old male presented with two day history of cough, rhinorrhea, and fever. Initial vitals were significant for respiratory rate of 60 breaths per minute and a heart rate of 180 beats per minute. Physical examination revealed nasal flaring and crackles on auscultation. Electrocardiograph revealed diffuse ST segment elevation, and echocardiogram showed ejection fraction(EF) of 25 %. Intubation was performed for respiratory failure and shock. The patient suffered cardiovascular collapse post-intubation and received CPR for 1.5 hours until veno-arterial ECMO was initiated. On ECMO day two, a heart catheterization revealed left atrial hypertension (17mmHg) and balloon atrial septostomy was performed. Comprehensive PCR based viral respiratory panel (which has a sensitivity and specificity of more than 90%) was positive for coronavirus and Ebstein barr virus. Patient was treated with two doses of intravenous immunoglobulin (2 milligram per kilogram). He was successfully decannulated on ECMO day six. Repeat echocardiogram showed EF 55%. Patient subsequently was weaned off and had full neurological recovery.

DISCUSSION: Prevalence of viral myocarditis is 1 to 10 in 1,000,000 children and has been implicated in 12 % pediatric cardiac sudden deaths. Diagnosis is presumed based on echocardiogram and elevated cardiac enzymes; endomyocardial biopsy is required for definitive diagnosis. Treatment is supportive, with some evidence supporting the use of steroids and IVIG. Fulminant myocarditis is rare and is characterized by rapid onset of cardiorespiratory failure requiring mechanical ventilation and inotropic support. Coronavirus associated myocarditis has been described in rabbits, yet no cases have been reported in children. Though EBV also was also positive, we believe coronavirus contributed to ongoing inflammation and myocarditis.

CONCLUSIONS: This patient had remarkable recovery after a prolonged CPR for cardiovascular collapse. It is possible further cases of coronavirus associated myocarditis will be diagnosed with increased availability of more comprehensive PCR testing for common viral pathogens.

Reference #1: Adv Exp Med Biol. 1993. Electrocardiographic changes following rabbit coronavirus-induced myocarditis. Alexander et al.

DISCLOSURE: The following authors have nothing to disclose: Sangeetha Rao, William Sasser, Franco Diaz, Nirmal Sharma, Jeffrey Alten

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