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Purpose: The American Society of Transplantation and the International Society of Heart and Lung Transplantation recommend COVID-19 vaccination of transplant candidates to maximize immunity, as vaccination after initiation of immunosuppression may confer only partial immunity. However, there are concerns about the impact of vaccine-induced systemic inflammatory responses in critically ill patients with variable hemodynamic states. We aim to explore the safety of pre-transplant vaccination by examining the immediate impact of COVID-19 vaccination on the hemodynamics of hospitalized patients awaiting transplant.

Methods: A retrospective chart review at a major transplant center was conducted among all heart transplant recipients from January 2021 through September 2021 who were hospitalized and listed or under consideration for transplant at the time of COVID-19 vaccination. Primary outcomes included vital signs, hemodynamic parameters from pulmonary artery catheter-derived measurements, and changes in inotrope/vasopressor infusion rates. Data were extracted at fixed time points 24 hours before and up to 72 hours after vaccination. Given the small sample size and exploratory study nature, only univariate analysis was performed.

Results: Of the 50 patients who received heart transplants at our center from January 2021 through September 2021, 37 patients were vaccinated against COVID-19, 13 of those were patients who were vaccinated before transplant while hospitalized, and 10 of those 13 patients had a pulmonary artery catheter in place at the time of immunization. No significant changes in vital signs (blood pressure, heart rate), hemodynamics (cardiac index, pulmonary artery pressures, systemic vascular resistance), or vasopressor/inotrope infusion rates were observed after vaccination.

Conclusion: In this exploratory review of COVID-19 vaccination in heart transplant candidates, we did not detect any notable changes to hemodynamics in the first 72 hours after immunization. Although further investigative research is needed to assess COVID-19 vaccine safety comprehensively in patients with advanced heart failure, the absence of notable hemodynamic changes in this cohort of heart transplant candidates encourages the continued use of COVID-19 vaccination among hospitalized patients with advanced heart failure who are awaiting transplant.

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Breakthrough COVID-19 Infections in Heart Transplant Recipients: A Case Series

D.J. Miklin,1 A. Cochran,2 B. Rosen,2 A. Berg,2 M. Cunningham,2 R. Lee,1 A. Wolfson,1 A. Vaidya1, and E.C. DePasquale2. 1Internal Medicine, University of Southern California, Los Angeles, CA; 2Heart Transplant and Mechanical Circulatory Support, University of Southern California, Los Angeles, CA; and the 3Cardiac Surgery, University of Southern California, Los Angeles, CA.

Purpose: Heart transplant (HT) recipients are at high risk for Covid-19 infection, and data are limited about the efficacy of vaccination in this unique population. We sought to describe the presentation and outcomes of a cohort of HT patients with Covid-19 infection despite prior vaccination.

Methods: Retrospective chart review of 250 adult HT recipients followed at the University of Southern California identified 7 individuals with PCR-proven Covid-19 infection after full vaccination (no patients received booster doses) between December 1st, 2020 and October 1st, 2021. Baseline clinical characteristics, serial echocardiographic parameters, laboratory testing; medication regimens, clinical presentation and clinical course were collected.

Results: A total of 237 were vaccinated with an incidence of 7 breakthrough infections (3%). Patients were predominantly male (71%) with a median age of 50 years old. The average BMI was 32.89. Hypertension (86%), diabetes (57%), and hyperlipidemia (43%) were common. Nearly all (71%) of patients were on 3 classes of immunosuppressive therapy, and nearly half (43%) had a history of rejection. Five patients (72%) received Pfizer-BioNTech. 1 patient (14%) received Moderna, and 1 patient (14%) received the Johnson & Johnson vaccine. One patient had a prior history of Covid-19 infection before vaccine availability. Patients were on average 6.74 (3.8-8.4) years out from transplantation. The most common presentation was dyspnea (71%), cough (57%), and fever (43%). Seventy one percent were hospitalized, and 29% were admitted to the ICU. Treatments varied, with equal rates of antibiotics (29%), steroids (29%), and remdesivir (29%). However the most common treatment was monoclonal antibody therapy (57%). One patient, vaccinated with a single Johnson & Johnson shot, died lending an 86% survival rate for breakthrough infections after Covid-19 vaccination.

Conclusion: In a single center experience 7 patients with a history of heart transplant and breakthrough Covid-19 infection were identified and found to have an 86% survival rate. Further investigation is needed assessing the efficacy of the Covid-19 vaccination in this population, as well as evaluation for differential outcomes between the various vaccine options.

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Racial and/or Ethnic Disparity in Multisystem Inflammatory Syndrome in Children (MIS-C) in the State of Mississippi, USA, July 2020 to June 2021

B.B. Das,1 J. Niu,2 and W.B. Moskowitz,1 1Pediatrics, Division of Cardiology, University of Mississippi Medical Center, Children’s Hospital of Mississippi, Jackson, MS; and the 2Research Department, Joe DiMaggio Children’s Hospital, Memorial Health Care System, Hollywood, FL.

Purpose: The racial composition of Mississippi is Caucasian (C) 58%, African American (AA) 38%, and others 4%, whereas the SARS-CoV-2 PCR positive rates are 16% in AA, 25% in Hispanics, and 6% in C children. We aimed to study the disparities of MIS-C in Mississippi and whether MIS-C follow the same racial distribution as SARS-CoV-2 infection?

Methods: Retrospective study of consecutive MIS-C patients <18 years of age hospitalized at our center over 1 year. We compared demographics, clinical presentation, laboratory findings, and treatment of MIS-C by race/ethnicity. We compared the distribution of MIS-C cases with that of SARS-CoV-2 infection rates.

Results: During the study period, 51 MIS-C patients hospitalized. Median age was 9 year, 58% male, 36(71%) were AA, 13(25%) were C, 1 was Asian, and 1 was Hispanic. We found a significant delay between onset of symptoms and hospitalization in AA than C children, 2.3±2.1 vs. 0.6±1.5 days (p=0.002). Cardiac symptoms were present in 24%, and 39% had Kawasaki’s disease-like symptoms. Only absolute neutrophil count was associated with cardiac dysfunction (p= 0.01) on multivariate analysis. Creatinine and ferritin levels were associated with ICU admission; p= 0.01 and 0.03, respectively. Differences in inflammatory and cardiac biomarkers between AA and C races are summarized in Figure 1. AA children with MIS-C had increased length of hospitalization (8.1 vs 5.2 days; p= 0.04), a higher trend of more admissions to ICU (38.9% vs 23.1%; p=0.3) and cardiac involvement (36.1% vs 23.1%; p=0.5) than C children (Figure 2).

Conclusion: In Mississippi, racial disparity in MIS-C exceeds the differences of SARS-CoV-2 infection rates in children. AA children had delayed hospitalization from the onset of symptoms, severe inflammation, longer length of stay, a higher trend for more cardiac dysfunction and ICU admissions than C children. Our findings could assist health professionals in devising appropriate strategies to target minority children.