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for treatment of hypoxic patients with remdesivir and steroid, we have demonstrated a lower mortality from COVID-19 compared to other studies on HT recipients. No mortality was observed in the breakthrough cases.

(785)
Characteristics and Outcome of COVID-19 Infection in Heart Transplantation Recipients in the Netherlands
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Purpose: Immuno-compromised patients are at high-risk for complicated COVID-19 infection. The aim of this study is to describe the characteristics and outcome of heart transplantation (HTx) recipients infected with COVID-19 in the Netherlands.

Methods: All HTx patients with a COVID-19 infection between February 2020 and June 2021, proven by positive polymerase chain reaction-test or positive serology in one of the three heart transplant centers in the Netherlands were retrospectively included. The primary endpoint of this study is all-cause mortality.

Results: COVID-19 was diagnosed in 54/665 (8%) HTx patients, mean time from HTx was 11±8 years, mean age 53±14 years and 39% were female. Immunosuppressive therapy was reduced in 37%, 21 (39%) patients required hospitalization and all-cause mortality was 6%. Severe COVID-19 disease (hospitalized with ICU admission or mortality) was seen in 7 (13%) patients. Compared to patients with mild (not hospitalized) or moderate (hospitalized, no ICU admission) COVID-19 infection, patients with severe COVID-19 infection were generally older (p=0.007) and had a history of ischemic heart failure (p=0.004) more frequently. Compared to patients with moderate COVID-19 infection, severe COVID-19 patients were transplanted earlier and had a significantly higher body mass index (30±3 vs 26±3; p=0.01). Myocardial infarction, cellular rejection and pulmonary embolism were observed once in three different HTx patients. Physical complaints post-infection persisted with a median of 30 days (IQR 30-83 days) in 16 (39%) cases.

Conclusion: HTx patients are at increased risk for complicated COVID-19 infection with frequent hospitalization, but mortality is substantially lower than previously described.

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Efficacy and Safety of mRNA SARS-CoV2 Vaccination in Heart Transplant Recipients
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Purpose: Data on immunologic response to SARS-CoV2 vaccination in heart transplant recipients are scarce. We investigated the efficacy and safety of mRNA SARS-CoV2 vaccination in this patient population.

Methods: In a retrospective single-center study we included 54 consecutive adult heart transplant recipients who received 2 doses of mRNA SARS-CoV2 vaccine between January 1 and June 30, 2021. All patients were followed for 112±28 days after the second dose. At the end of follow-up we measured humoral response to SARS-CoV2 by assessing total antibody levels to the receptor-binding domain of SARS-CoV2 spike (S) protein using anti-RBD immunoblot. Anti-S antibody serum levels ≥250 BAU/mL were considered protective. At the same time, cellular response was measured by the IFN-γ response to S-peptide stimulation of recipient T lymphocyte populations. Protective cellular response was defined as more than 0.3% of IFN-γ responsive T cells.

Results: Of 54 recipients, 44 (81%) were male with a mean age of 63±8 years and a mean time from transplantation of 6.6±4 years. Immunosuppressive regimen consisted of tacrolimus (mean C0 level 7.4±1.7 μg/mL), mycophenolate mofetil (mean dose 2120±419 mg) and steroids (mean dose 2.5±0.9 mg). The majority of patients received BTN162b2 vaccine (83%), and 17% of recipients were vaccinated with mRNA-1273. During follow-up, a humoral response was present in 24 (44%) of the recipients (median anti-S serum level 35.5 BAU/mL). We found no difference in humoral response between patients receiving BTN162b2 and mRNA-1273 vaccine (median anti-S serum level 68.3 BAU/mL vs. 15.5 BAU/mL, P=0.81). Protective humoral response was observed in 6 (11%) of the recipients (median anti-S serum level 557 BAU/mL). A cellular response to vaccine was present in 3 (6%) of the recipients; all 3 displayed a protective level of response. No recipients developed simultaneous protective humoral and cellular responses. Recipient age was the only predictor of protective humoral response (55±11 years in responders vs. 65±8 years in non-responders; P=0.001). In 3 (6%) recipients we found worsening of allograft function requiring hospital admission, which occurred within 1 month after receiving the second dose of vaccine.

Conclusion: In heart transplant recipients, mRNA SARS-CoV2 vaccination appears to be of limited efficacy and may, in some cases, be associated with worsening of allograft function.

(787)
Impact of COVID-19 Vaccination After Orthotopic Heart Transplantation
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Purpose: The effect of COVID-19 vaccination in orthotopic heart transplant (OHT) patients is unknown. After OHT, patients are increased risk of COVID infection and hospitalization.

Methods: We retrospectively analyzed 119 patients who underwent OHT between 2017 and 2021. Eleven patients were excluded who died prior to the COVID outbreak in the United States.

Results: The mean age was 51 years (IQR 26). The known vaccination rate (partial or complete) was 83%. The overall infection rate was 14% (17 COVID cases were identified.) Five patients were infected prior to the availability of the COVID vaccine. Of the remaining 2 (16%) and 5 (42%) were in vaccinated and unvaccinated patients respectively. The hospitalization rate due to COVID infection or COVID-related complications such as supplemental oxygen use was 29%. All hospitalized patients underwent changes in their antirejection therapies, and half required oxygen supplementation therapy at discharge. No COVID-related deaths were identified. There were 2 partially/fully vaccinated patients at the time of COVID infection. One patient had mild symptoms and did not require hospitalization while the other patient was asymptomatic.

Conclusion: Hospitalization rates were markedly higher in the OHT cohort compared to Kentucky state data (29% vs 4%). Multiple factors contribute to this finding. Patients with OHT have more co-morbidities and after OHT and immunosuppressant therapy blunts host response to infection placing these patients at higher risk of complications. There was a higher vaccination rate in our OHT cohort compared to Kentucky state data (83% vs 61%). Breakthrough COVID infection was found in only 4% of OHT patients strongly supporting the efficacy of the vaccination in this immunosuppressant subgroup. While there were no COVID related deaths in our cohort, downstream complications related to immunosuppression changes and organ rejection detection require long term follow up. The vaccine has proved highly efficacious in this group and should be implemented up front, prior to transplantation. We suggest pre-transplant COVID-19 vaccination should become mandatory in patients being evaluated for OHT.

(788)
Hemodynamic Effects of COVID-19 Vaccination in Hospitalized Patients Awaiting Heart Transplantation
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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 listing 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 patients 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

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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 from January 2021 through September 2021, with fixed time points 24 hours before and up to 72 hours after vaccination. 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 patients 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.

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

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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 years, 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.