A Scoping Review on The Impact of COVID-19 on Kidney Transplant Patients in the United States

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Abstract

Background: SARS-CoV2, responsible for the Coronavirus disease (COVID-19) pandemic, is a highly infectious virus that quickly became and continues to be a public health emergency given the severe international implications in the sectors of healthcare, economy, and quality of life.

COVID-19 can manifest differently in each person, ranging from asymptomatic to severe illness. Patients specifically in the immunocompromised state, such as those undergoing kidney transplantation, are at an increased risk for severe illness from COVID-19, and require hospitalization for more aggressive treatment to ensure survival. COVID-19 has been infecting kidney transplant recipients (KTRs), affecting their treatment protocols and threatening their survival.

Objective: The objective of this study is to conduct a scoping review on the impact of COVID-19 on kidney transplant patients in the United States in terms of prevention, various treatment protocols, hospitalization rates and risk factors.

Methods: This study was designed as a scoping review to gather evidence on the effect of COVID-19 on kidney transplant recipients (KTRs). Following PRISMA guidelines, we searched peer-reviewed literature involving COVID-19, kidney transplants, prevention, and treatment protocols in kidney transplant patients using databases PUBMED, MEDLINE/Elseco, and EMBASE. The search was restricted to articles that were published in the USA on US kidney transplant patients on or after 2019. Boolean operators were used for the search, which combined the following terms: Kidney Transplant AND SARS-CoV-2 OR Covid-19 OR coronavirus AND Treatment OR Protocol. The initial search yielded 1,023 articles after removing duplicates. After screening based on the inclusion and exclusion criteria, and after further analysis, 20 articles were selected.

Results: The main domains for data extraction were 1) Impact of COVID-19 on performing kidney transplants, 2) Impact of COVID-19 vaccinations on Kidney Transplant Recipients (KTR), 3) Outcomes of Various Treatment Regimens for Kidney Transplant Recipients with COVID-19, 4) Hospitalization Rates for COVID-19 Kidney Transplant Recipients and non-kidney transplant patients, and 5) risk factors. Waitlisted patients for kidney transplants had a higher risk of mortality compared to non-transplant patients. KTRs had higher rates of hospitalization especially if placed on prednisone - induced immunosuppression. COVID-19 vaccinations in KTRs are found to be safe, and the immune response can be improved by placing patients on a low dose of mycophenolate prior to vaccination. Withdrawal of immunosuppressants showed a mortality rate of 20% without increasing the rate of acute kidney injury.

Conclusion: COVID-19 has had a significant impact on kidney transplant recipients (KTRs). Kidney transplantation, along with the accompanying immunosuppressant regimen, provides KTRs with better infection outcomes compared to waitlisted patients. Hospitalization, graft dysfunction, AKI, and respiratory failure were the most common risk factors that increased risk of mortality in COVID-19 positive KTRs. Withdrawing KTRs from immunosuppressive drugs was not effective, and further studies are needed to research the effect of specific drugs and dosages on the severity and mortality rate of COVID-19 in KTRs.