

COVID-19 affects transplant recipients differently, possible therapeutic approach suggested

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Recipients of liver transplants who contracted COVID-19 recovered faster with less severe inflammation than heart or kidney transplant

recipients, and some even did better than non-transplant patients, according to a study conducted at Hospital das Clínicas (HC), the hospital complex run by the University of São Paulo's Medical School (FM-USP) in Brazil. An article describing the study and its main results is published in the journal *Transplantation*.

The researchers analyzed the progression of COVID-19 in 39 solid organ transplant recipients, 25 of whom had received kidney transplants, with hearts and livers each going to seven. The results of the analysis were compared with data for a [control group](#) comprising 25 non-transplant COVID-19 patients matched for age and without comorbidities. All participants in the study were examined every day for biomarkers of infection by SARS-CoV-2 in order to monitor [disease progression](#). The volunteers were divided by organ received, age, and time since the transplant.

"A hypothesis that could explain this unequal progression of the disease among [transplant patients](#) relates to different amounts of immunosuppressants used to prevent organ rejection," Ricardo Wesley Alberca, first author of the article, told Agência FAPESP. Alberca has a postdoctoral scholarship from FAPESP.

Heart and kidney transplants require larger amounts of immunosuppressants than liver transplants, for example. "In light of this difference, besides the conclusion that not all transplant recipients respond to COVID-19 in the same manner, our study also points to a possibility of testing certain immunosuppressants to treat COVID-19 patients, whether or not they are transplant recipients," he said.

However, he added, the probable link between amounts of immunosuppressants and the progression of COVID-19 among transplant recipients is only a hypothesis, and further research is needed to test it.

"These patients receive different immunosuppression treatments. Kidney and heart recipients receive a much larger amount of immunosuppressants than liver recipients. In fact, a clinical trial now being conducted by a group of researchers outside Brazil involves a very well-known immunosuppression treatment administered to liver recipients," he said.

The FM-USP researchers believe mild immunosuppression during infection by SARS-CoV-2 might have positive results for patients. "This has yet to be investigated, but in theory mild immunosuppression might be beneficial in cases of immune system hyperactivation, such as the so-called cytokine storm typical of severe COVID-19, where the organism responds in an exaggerated manner, potentially leading to death," he said.

High-risk group

Since the start of the pandemic, patients with comorbidities, older patients and transplant recipients have been considered high-risk groups for severe COVID-19. However, [transplant](#) recipients are a specific group within the overall population, and the small amount of research on them has not compared the effects of the disease in recipients of different organs.

The FM-USP study is part of a broader epidemiological survey of more than 500 COVID-19 patients treated at the HC in first-half 2020. It is supported by FAPESP and also by funding from CAPES, the Ministry of Education's Coordination for the Improvement of Higher Education Personnel.

The researchers plan to investigate infection by SARS-CoV-2 in subjects who are undergoing treatment with immunosuppressants or immunomodulators, such as patients with psoriasis, atopic dermatitis, or

HIV/AIDS (who take antiretrovirals).

"We're analyzing the impact of different comorbidities on the immune response to COVID-19, and we hope the study will lead to a better understanding of the immunopathogenesis of the disease in association with diseases or conditions that require treatment with immunosuppressants, as do organ transplants," said Maria Notomi Sato, a professor at FM-USP.

The other authors of the article are researchers at FM-USP's Dermatology and Immunodeficiency Laboratory (LIM-56) and other institutions, such as Adolf Lutz Institute (the central public health laboratory for São Paulo state), the Biomedical Sciences Institute (ICB-USP), and Oswaldo Cruz Foundation (FIOCRUZ), an arm of the Ministry of Health. The group also plans to evaluate possible treatments for the inflammatory syndrome triggered by the novel coronavirus.

More information: Ricardo Wesley Alberca et al, COVID-19 Severity and Mortality in Solid Organ Transplantation: Differences between Liver, Heart, and Kidney Recipients, *Transplantation* (2021). [DOI: 10.3390/transplantation2030030](https://doi.org/10.3390/transplantation2030030)

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