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CASE REPORT

Kidney Transplantation from Donor with SARS-CoV-2 Positivity in Brazil

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Nothing to declare.

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Abstract: Due to uncertainties about the impact of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, the donation of organs from individuals with suspected or confirmed infection of coronavirus disease 2019 (COVID-19) is absolute contraindication. However, this action caused reduction in the number of kidney transplants and increase in mortality in the waitlist. Because of that, the possibility of extrapulmonary organ transplantation from donors with SARS-CoV-2 positive with asymptomatic or mild illness has been questioned. In this context, the present study aimed to report the case of a 40-year-old female recipient in hemodialysis six years ago, whom received a kidney from donor who had real-time polymerase chain reaction (RT-PCR) test detectable for SARS-CoV-2 after two days of the surgery transplantation. During hospitalization, she had no respiratory symptoms, and all RT-PCR tests for SARS-CoV-2 nasopharyngeal secretion performed had undetectable results. Thus, after 39 days of hospitalization and with good clinical and laboratory evolution, the patient was discharged to remain in outpatient follow-up.

Descriptors: Kidney Transplantation; COVID-19; Tissue Donors.

INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic in Brazil resulted in more than half a million deaths, and more than 20 million infected by August 2021.[1] Due to uncertainties about the impact of severe acute respiratory syndrome coronavirus 1 (SARS-CoV-2) infection in immunocompromised patients, the Brazilian Health Regulatory Agency (Agência Nacional de Vigilância Sanitária – ANVISA) determined as an absolute contraindication the donation of organs from individuals with suspected or confirmed infection in the last 28 days. Thus, many countries, including Brazil, have established a screening with real-time polymerase chain reaction (RT-PCR) test COVID-19 for all individuals eligible for organ donation, in which a negative result would enable donation.[1]

However, this action caused reduction in the number of kidney transplants by 50% and increase in mortality in the waitlist.[2,3] Because of that, the possibility of extrapulmonary organ transplantation from deceased donors with SARS-CoV-2 positive with light to mild illness has been questioned in several countries.[4] Until now, there is no relevant scientific evidence of transmission or damage for the receptor of an organ from an individual infected with SARS-CoV-2.[5]

In this context, the present study aimed to report the case of a dialysis patient who received a kidney transplant from a deceased donor with RT-PCR test detectable for SARS-CoV-2.

CASE REPORT

Donor data

A 38-year-old female diagnosed with brain death as a result of a car accident. She had a kidney donor profile index (KDPI) of 30%, blood type O positive. On admission to the hospital (day 1), the patient has been tested to RT-PCR for SARS-CoV-2 with nasopharyngeal swab sample, and it had an undetectable result. As reported by her family, she has not had respiratory symptoms in the past 28 days and no comorbidities. After five days of hospitalization (day 5), a new RT-PCR test for undetectable SARS-CoV-2 was performed to realize the organ transplantation surgery. However, for the corneal capture, the donor was submitted 48 hours after the second test (day 7) to a new RT-PCR test for SARS-CoV-2 of nasopharyngeal swab sample with a positive result.

Recipient data

The 40-year-old female recipient diagnosed with systemic lupus erythematosus (SLE) developed lupus nephritis requiring hemodialysis six years ago. She progressed with access failure and had been on peritoneal dialysis for two years, but with progressive loss of efficiency. The SLE had been out of activity, and she was using only 5 mg of prednisone a day. Regarding medical history, she had hypothyroidism, more than 10 blood transfusions and blood type A positive. The patient denied previous COVID-19 infection and on admission. As the protocol of the hospital service, the antigen test to SARS-CoV-2 with nasopharyngeal swab sample was performed in the patient and it had a negative result. In addition, she took two doses of the COVID-19 AstraZeneca, one in May and the other one in August 2021.

After kidney transplant surgery (day 5), the patient developed an allergic reaction attributed to the use of antibiotics, but without other postoperative complications. In the first five days of postoperative period, she remained on peritoneal dialysis.

Without the need for dialysis support from that period on, the nitrogenous slag gradually decreased. In addition, the recipient underwent induction immunosuppression therapy with thymoglobulin and a triple maintenance regimen with tacrolimus, prednisone, and mycophenolate.

During hospitalization, she had no respiratory symptoms, and all RT-PCR tests for SARS-CoV-2 nasopharyngeal secretion performed weekly for six consecutive weeks had undetectable results. Thus, after 39 days of hospitalization and with good clinical and laboratory evolution, the patient was discharged to remain in outpatient follow-up.

DISCUSSION

The COVID-19 pandemic brought important changes in the regulation of organ transplants, so that new protocols were created.[6] Therefore, the production of knowledge about this viral infection has questioned whether the risk of death on the transplant waitlist is greater than the risk of receiving the organ from a donor with mild to moderate disease. Thus, the recommendations were revised based on new evidence and with the development of the vaccine against SARS-CoV-2.[7]

Up to now, the transmission of SARS-CoV-2 through transplantation has not been consistently documented in the scientific literature. Although the virus was identified by electron microscopy and immunohistochemistry in the kidney, in these studies viral culture was not performed to verify infectivity and pathogenicity in the post-transplant period.[8] Furthermore, those investigations included donors who had a severe presentation of the disease with consequent death from organ dysfunction. Therefore, it is not appropriate to reflect these results for populations with asymptomatic or mild COVID-19.[4]

In previous outbreaks of other beta-coronaviruses that cause lower respiratory tract infections, such as severe acute respiratory syndrome coronavirus 1 (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV), there are no reports of transmission by blood transfusions or transplants.[9,10] In addition, other researches with donors affected by respiratory RNA viruses with viremia similar to that of the coronavirus and with renal tropism showed that there were no transmission or complications associated with extrapulmonary organ transplantation.[4]

A case series study of 10 patients who received kidneys from donors with the detectable RT-PCR test for SARS-CoV2 showed that there was no transmission of the virus to recipients or healthcare professionals during surgery. Therefore, some benefits are suggested when death is not related to the coronavirus and with asymptomatic or mild disease presentation.[4]

Furthermore, another point to be highlighted is the importance of reformulating clinical screening protocols for potential organ donors.[6] The detection of SAR-CoV-2 virus by RT-PCR with nasopharyngeal and oropharyngeal specimens is considered the gold standard.[11] However, this test has an important chance of having a false-negative result. In the group of symptomatic

people, approximately 30% will have a false-negative result. Thus, in an asymptomatic population, an even higher error rate is suggested by the change in the pre-test probability.[11,12] Therefore, the strategy of performing repeated tests can be carried out, since the probability of finding SARS-CoV virus increases with the time, if it is present.[11]

Thus, the COVID-19 pandemic is a challenge to the health system because it impacts the availability of donors. In this case report, the recipient did not show clinical and laboratory signs of SARS-CoV-2 infection on the 39th postoperative day. Thus, the research team contacted Organ Procurement Organization (OPO) of the hospital, which notified the deceased donor, and the recipient of the other kidney progressed without respiratory symptoms or complications.

The present study has limitations, and the authors recognize that there is a possibility that the result of the COVID-19 test performed in the deceased donor may be false-positive. We also recognize the possibility of nosocomial infection, as well as that a follow-up longer than this study is necessary to verify the long-term impact on recipients. This report is not intended to determine conduct, but we emphasize the importance of documentation and continuous analysis to guide organ transplantation in the face of the COVID-19 pandemic.

AUTHORS' CONTRIBUTIONS

Substantive scientific and intellectual contributions to the study: Silva CDCC, Pantoja GM, Migone SRC, Rego VP and Monteiro APS; **Technical procedures:** Silva CDCC and Pantoja GM, Migone SRC, Rego VP; **Analysis and interpretation of data:** Silva CDCC, Pantoja GM, Migone SRC, Rego VP and Monteiro APS; **Manuscript writing:** Silva CDCC and Pantoja GM; **Critical revision:** Migone SRC; **Final approval:** Migone SRC.

DATA AVAILABILITY STATEMENT

Not applicable.

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