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Hospital Management and Ambulatory Patient Care After COVID-19 Infection in Kidney Transplant

Magdalena Terán Redondo, Claudia Muñoz Martínez, Pedro Rosa Guerrero, M. Luisa Aguera Morales, Álvaro Torres De Rueda, and Alberto Rodríguez Benito

Nephrology Department, University Hospital of Burgos, Burgos, Spain; and Nephrology Department, Reina Sofia University Hospital of Cordoba, Cordoba, Spain

ABSTRACT

Background. A large number of registries have been collected for kidney transplant recipients infected with COVID-19.

Methods. From March 2020 to April 2021, our team conducted an observational study, which included all patients who showed a polymerase chain reaction positive for COVID-19. Patients were divided into 2 groups: patients who required ambulatory care and patients who needed hospital admission.

Results. A total of 76 kidney transplant recipients were infected with COVID-19. A total of 33% required hospital admission and 65% received ambulatory treatment; 28% of our patients were asymptomatic and 6.8% died. Immunosuppressive treatment was modified in both study groups, and there were not any acute rejection episodes or changes in the human leukocyte antigen antibodies profile in our patients during our clinical trial.

Conclusions. In our study there was a significant percentage of patients who did not require hospital admission compared with other studies. In addition, we think that the reduction of immunosuppression can be a safe and reliable treatment.

December 2019 was the beginning of the outbreak of COVID-19 [1], which threw the world into the midst of a new global pandemic. Spain has been one of the most affected countries, with a total of 4,660,041 confirmed cases (up to August 11, 2021) [2].

A large number of registries have been collected both in Spain and abroad in transplant recipients infected with COVID-19, and, more specifically, in kidney transplant recipients [3–5]. In light of the current situation, our team decided to perform a data collection in kidney transplant recipients infected with COVID-19 under active follow-up in our area (Córdoba, Spain).

MATERIALS AND METHODS

From March 2020 to April 2021, our team conducted an observational, descriptive research study in the Kidney Transplant Unit at Reina Sofia University Hospital, which included all patients who showed a polymerase chain reaction positive for COVID-19. We had a very reliable source of information at our disposal since we were informed by the Andalusian Autonomic Transplant Coordination Service with complete identifiable data from each patient with a functional kidney allograft who had eventually tested positive for COVID-19 in a polymerase chain reaction test in primary or hospital care within the region. Patients were divided into 2 groups: patients who required ambulatory care and patients who needed hospital admission.

RESULTS

A total of 76 kidney transplant recipients infected with COVID-19 were included in our study, which was 8.6% of the kidney transplant recipients being followed up at Reina Sofia University Hospital. From those, 25 patients required hospital admission and 49 patients received ambulatory treatment. There were 2 patients from whom we could not gather data. We compared the clinical and demographic characteristics from both groups (Table 1). A total of 28% of our patients were asymptomatic and 6.8% died. As a consequence of COVID-19 infection,
21.1% of our patients had a kidney graft dysfunction, 3 patients required renal replacement therapy, and 1 patient required permanent hemodialysis. All modifications made in the immunosuppressive therapy are shown in Fig 1. There were no acute rejection episodes or changes in the anti-human leukocyte antigen antibodies profile in our patients within the studied period.

DISCUSSION

Compared with similar studies reporting a 21% to 28% rate of mortality [3,5,6], our series show a lower mortality rate (6.8%), a low incidence of hospital admissions (33%), and a high rate of asymptomatic patients (28%). Most of our transplant recipients with COVID infection were treated at home (65.3%). Cristelli et al reported that the majority of their patients required hospitalization (69%) and only 31% of their patients were treated at home [6]. We think that these results are attributable not only to the reliability of our sources of information to identify patients who were COVID-positive with mild disease but also to the fact that these patients might not have been considered in other studies as accurately as in ours. Our main conclusion was that the majority of our transplant recipients with COVID infection were treated at home instead of being hospitalized, unlike other series report. There is still some uncertainty about the optimal management of these patients after the development of COVID-19 infection. Moreover, the results show that infected kidney transplant recipients have a high mortality rate and a high hospital admission rate [3,5] compared with controls who have not received a transplant. This might be justified by the immunosuppressive therapy and by the comorbidities associated with these patients. Health recommendations suggest the reduction of immunosuppression and even the removal of antimetabolite, mammalian target of rapamycin inhibitors, and calcineurin inhibitors [4,5,7] according to the clinical situation, which our records confirm takes place with our patients. Regarding corticosteroid treatment, the dose remained unchanged and in some cases was increased [7].

CONCLUSIONS

In conclusion, COVID-19 infection affects kidney transplant recipients more severely than the general population, but nevertheless there is a significant percentage of paucisymptomatic

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**Table 1. Clinical and Demographic Characteristics According to the Different Study Groups**

| Characteristic                                      | Hospital Admission | Ambulatory Patient Care | P Value |
|-----------------------------------------------------|--------------------|-------------------------|---------|
| Sex, % male patients                                | 68                 | 65                      | .817    |
| Age, mean (SD), y                                   | 56 (15)            | 56 (16)                 | .702    |
| DM, %                                                | 44                 | 41                      | .793    |
| HBP, %                                               | 84                 | 82                      | .800    |
| HBP treatment, mean (SD), no. of antihypertensive drugs | 3 (2)              | 2 (1)                   | .292    |
| Chronic respiratory pathology, %                   | 8                  | 4                       | .509    |
| BMI, mean (SD)                                      | 27 (6)             | 27 (4)                  | .435    |
| Time since kidney transplant, mean (SD), mo         | 102 (73)           | 92 (81)                 | .380    |
| Treatment with MMF, %                               | 84                 | 78                      | .514    |
| Treatment with mTOR inhibitors, %                   | 4                  | 12                      | .482    |
| Treatment with calcineurin inhibitors, %            | 100                | 94                      | .207    |
| Treatment with corticosteroids, %                   | 96                 | 96                      | .987    |
| Creatinine level prior to COVID-19 infection, mean (SD), mg/dL | 1.9 (0.9)           | 1.4 (0.5)               | .020    |
| WBC level prior to COVID-19 infection, mean (SD), £10^6/µL | 6.96 (2.09)        | 7.98 (2.73)             | .127    |
| Hemoglobin level prior to COVID-19 infection, mean (SD), g/dL | 13 (2)             | 14 (2)                  | .456    |
| Albumin level prior to COVID-19 infection, mean (SD), g/dL | 4.5 (0.4)          | 4.6 (0.3)               | .874    |

BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); DM, diabetes mellitus; HBP, high blood pressure; MMF, mycophenolate mofetil; mTOR, mammalian target of rapamycin; WBC, white blood cell count.
patients who could be managed at home. In addition, we think that a monitored reduction in immunosuppression is safe and may help successful recovery.

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