

convent in the Basque Country region with some cohabiting nuns. Unfortunately, after 1 week in his new home, he developed fever, cough, diarrhea, anorexia and asthenia. A SARS-CoV2 test was performed on the cohabitants confirming COVID-19 infection in all of them. That infection was probably acquired before traveling, as he was living in Madrid, the Spanish pandemic epicenter. Due to the situation, he decided to remain at home with the support of the sanitary nun. Although during the first week the patient was clinically stable, on the eighth day he developed dyspnea and his oxygen saturation (assessed by a portable pulse oximeter) dropped. He was administered azithromycin and corticosteroids and oxygen support (with the CPAP machine, some days for 24 hours). The daily dialysis scheme was intensified from 6- to 7-days per week.

Evolution was favorable, and he recovered without external medical assistance. After 4 months, he went to his usual medical visit in Madrid and a chest-X-ray was performed confirming some chronic fibrous lesions suggestive of past COVID-19 infection. Antibodies for SARS-CoV2 were positive.

Despite its comorbidities (including the need for hemodialysis), the patient recovered at home thanks to the medical knowledge of his cohabiting nuns including their ability to manage the aspects related to dialysis. This is still an exception as a specific plan for home dialysis caretakers has not been sufficiently developed.⁴

In conclusion, home-based renal replacement therapies are an opportunity to keep safe CKD patients with SARS-CoV2 infection.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest and disclosures.


Severity of COVID-19 in end-stage kidney disease patients on chronic dialysis

Dear Editor,

There were some contentious issues concerning the severity of COVID-19 among end-stage kidney disease (ESKD) patients on chronic dialysis when an initial study reported a lesser severity of COVID-19 among those individuals.¹ To clarify this, we conducted a systematic review to explore the prevalence of severe COVID-19 and the mortality rate of COVID-19 among ESKD patients on chronic dialysis.

PATIENT CONSENT

The patient signed written consent for publication.

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DOI 10.1111/1744-9987.13615

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A literature search was performed of the electronic databases PubMed and the Cochrane Central Database, with the specific terms (“COVID-19” OR “SARS-CoV-2”) AND (“ESKD” OR “End-Stage Kidney Disease” OR “End-Stage Renal Disease” OR “ESRD”) AND (“Dialysis” OR “Hemodialysis”). A time restriction was applied from the date of inception to August 20, 2020, which was the date of our search finalization. All research articles in which the subjects were adult ESKD patients with

TABLE 1 Characteristics of included studies

Author	Location	Study	Period	Hospitalized dialysis patients with COVID-19	All dialysis patients with COVID-19 (including outpatients)	Total dialysis patients	Age ^a	Male (%)	Severe ^b (%)	In-hospital mortality (%)
Valeri et al ²	United States	Retrospective	March 9 to April 8, 2020	59	NA	NA	63 (56-78)	33/59 (56)	19/59 (33)	18/59 (31)
Naaraayan et al ³	United States	Retrospective	March 12 to May 13, 2020	27	NA	NA	NA	NA	15/27 (44.4)	NA
Ng et al ⁴	United States	Retrospective	March 1 to April 27, 2020	419	NA	NA	66 (55-75)	260/419 (62.1)	89/419 (21.2)	133/419 (31.7)
Yau et al ⁵	Canada	Retrospective	April 7 to 22, 2020	5	11	237	66 (63-72)	5/11 (55)	2/11 (18)	0
Alberici et al ⁶	Italy	Prospective	March 1 to April 3, 2020	57	94	643	72 (62-79)	62/94 (65.9)	45/94 (47.8)	24/57 (42.1)
Goicoechea et al ⁷	Spain	Retrospective	March 12 to April 10, 2020	36	36	282	71 (12)	23/36 (63.8)	12/36 (33.3)	11/36 (30.5)
Mazzoleni et al ⁸	Belgium	Retrospective	March 6 to April 14, 2020	25	40	62	75 (68-83)	23/40 (57.5)	22/40 (55.0)	11/25 (44.0)
Ma et al ¹	China	Retrospective	January 14 to March 12, 2020	15	15	230	71 (54-76)	10/15 (66.7)	3/15 (20)	2/15 (13.3)
Zhang et al ⁹	China	Retrospective	NA	31	NA	NA	62.3 (14.4)	18/31 (58.1)	12/31 (38.7)	2/31 (6.5)
Jung et al ¹⁰	South Korea	Retrospective	February to April, 2020	14	14	NA	63.5 (14.5)	6/14 (42.9)	5/14 (35.7)	2/14 (14.3)

Abbreviations: COVID-19, coronavirus disease 2019; ESKD, end-stage kidney disease; NA, not available.

^aData are presented either with mean (SD) or median (interquartile range).

^bSevere definition: The presence of acute respiratory distress syndrome, mechanical ventilation, respiratory failure, admittance to intensive care unit, or oxygen saturation of <93% (on room air).

COVID-19 on chronic dialysis were independently sorted, screened, and examined for relevance. Meta-analysis of proportion was conducted using MedCalc Statistical Software version 19.4.1 (MedCalc Software Ltd, Ostend, Belgium).

Overall, 381 publications were initially identified based on the search criteria and 26 articles were removed because of duplication. Then, of the remaining 355, 339 articles were excluded after title and abstract screening. After analyzing the remaining 16 full-text articles, six studies were removed because of the unavailability of data regarding severity or mortality of COVID-19 among ESKD patients on chronic dialysis. Finally, 10 articles were included in this analysis.

The characteristics of included studies are summarized in Table 1.¹⁻¹⁰ The overall prevalence of COVID-19 among dialysis patients, rates of severe COVID-19 and mortality among hospitalized ESKD patients on chronic dialysis in this study were 18.4% (95% confidence interval [CI] 6.0-35.0, $I^2 = 97.32%$, $P < .0001$), 45.3% (95% CI 26.5-64.9, $I^2 = 93.36%$, $P < .0001$), and 26.8% (95% CI 19.2-35.1, $I^2 = 67.74%$, $P = .0017$), respectively. While the severity of COVID-19 was relatively similar across the globe, the mortality rate was strikingly lower in Asia (11.48%, 95% CI 4.8-20.4, $I^2 = 0%$, $P = .5879$), compared to Europe (39.1%, 95% CI 30.7-48.0, $I^2 = 0%$, $P = .4565$) and the United States (31.7%, 95% CI 27.6-35.9, $I^2 = 0%$, $P = .8813$).

Based on our study, we found that ESKD patients on dialysis are highly susceptible to contracting severe COVID-19 with a substantially increased risk of mortality compared to the general population across the globe. Hypothetically, this is due to immunocompromised state along with multiple comorbidities in this specific population. Interestingly, the in-hospital mortality rate in Asia was reported to be lower compared to Europe or the United States. While the definite causes of the disparity in the mortality rate in those geographical region are still unknown, several possible hypotheses are suggested, including mutational variants of SARS-CoV-2, genetic factors, body mass index, and other demographic factors. The initial data showing lower severity and mortality of COVID-19 among ESKD patients on chronic dialysis have misled many authors to believe that ESKD patients might have special characteristics which could reduce the severity of COVID-19. Our findings clarified this contentious issue and further confirmed the evidence for the utmost necessity of additional COVID-19 precautions in HD centers.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

DATA AVAILABILITY

The data used to support the findings of this study are included within the article.

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DOI 10.1111/1744-9987.13597

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Peritoneal dialysis in the days of COVID-19

The global outbreak of coronavirus disease 2019 (COVID-19) has posed a threat to all populations. Patients with chronic kidney disease requiring dialysis are especially at high risk for severe illness and death. As such, physicians are forced to swiftly adopt and refine existing models of patient care. Peritoneal dialysis (PD) is a home-based kidney replacement therapy that has declined in recent years, despite offering several advantages such as preservation of residual renal function, patient independence, and low cost. Underutilization of PD is influenced by the increased number and joint ownership of hemodialysis (HD) units, financial incentives, transplantation, suboptimal training, lack of PD-dedicated units, and predialysis patient education programs. Ideally, patients should receive unbiased information about their options and physicians should support the choice of the well-informed patient. There is a strong relationship between the offering and selection of PD as chronic treatment modality. Unfortunately, nearly

half of patients report they were not given a choice and another third were not told about alternative modalities.¹

In the face of the pandemic, PD has several definite advantages.² The risk of COVID-19 exposure is less than HD since it is performed at home, which alleviates the risk of transmission both during travel time and time spent within the health facility. Treatment is uninterrupted as physicians continue to conduct telemedicine consultations and prescriptions. Close contact with health care workers, another potential COVID-19 source, is also reduced. Indeed, initial reports confirm the incidence of COVID-19 is much lower in PD patients.^{3,4}

We are a university hospital with a dedicated PD unit including a predialysis patient education program. During the pandemic, we were one of the few hospitals which continued to provide care for non-COVID-19 nephrology patients. Interestingly we observed a substantial increase in patients opting for PD at a time when COVID-19 was at its peak. We analyzed the number of

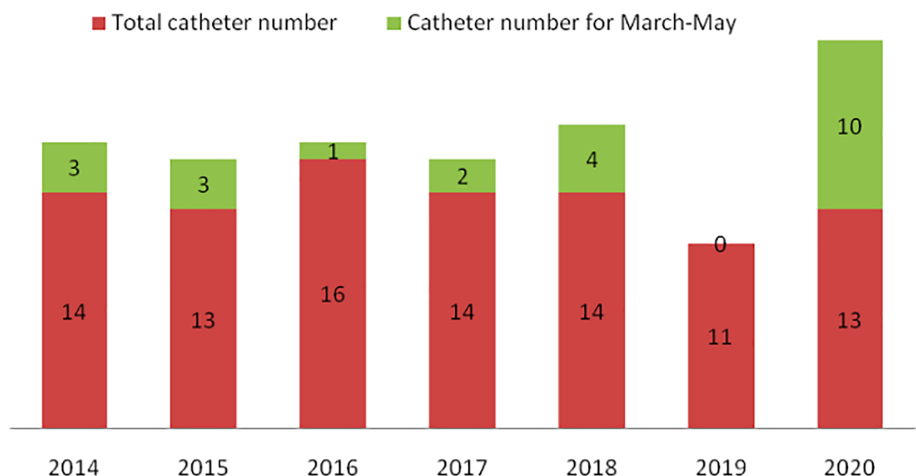


FIGURE 1 The number of peritoneal dialysis catheter insertions [Color figure can be viewed at wileyonlinelibrary.com]