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DISCLOSURE

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COVID-19 in dialysis patients: outlasting and outsmarting a pandemic

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Coronavirus disease 2019 (COVID-19) has affected the care and outcomes of patients treated with dialysis worldwide. In this issue of *Kidney International*, 3 reports highlight the disproportionately severe impact of COVID-19 on patients on dialysis, noting its high prevalence, particularly among patients receiving in-center dialysis. This likely reflects patients' limited ability to physically distance as well as community exposures, including residence in areas with high rates of infection. Patients on dialysis are at extremely high risk should they develop COVID-19, with short-term mortality of 20% or higher. Accordingly, it is imperative that the kidney community intervenes to reduce the threat of COVID-19 in this vulnerable population by focusing on modifiable factors, including universal masking of patients and staff and enhanced screening, including testing for COVID-19 in the patients who are asymptomatic during times of high local prevalence.

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see clinical investigations on pages 1519, 1530, and 1540

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worldwide.¹ While COVID-19 has ebbed in some regions, it is surging in others. Within the kidney community, we continue to seek better understanding of how to protect the patients at greatest risk, those who depend on dialysis.

For most of the 2 to 3 million patients treated with dialysis worldwide,² kidney failure is their defining chronic illness, their nephrologist is their principal care provider, and the dialysis facility is the site of the majority of their medical care; we in the kidney community therefore have a responsibility to our patients treated with dialysis during this pandemic. In March 2020, as cases surged in Northern Italy, New York City, and elsewhere, rapidly published editorials and guidelines advised on how best to keep patients on dialysis safe.^{3–5} These statements rightfully presumed a predisposition for infection due to inability to maintain physical distancing, particularly among those receiving in-center hemodialysis, and predicted worse outcomes due to comorbid conditions and, potentially, kidney failure-associated immunocompromise.

In this issue of *Kidney International*, 3 reports highlight the impact of COVID-19 on patients with kidney failure in Europe and the United States. Couchoud *et al.*,⁶ reporting data from the French Renal Epidemiology and Information Network (REIN) Registry of patients receiving maintenance dialysis, show that, among dialysis facilities with at least 1 patient with COVID-19, the COVID-19 prevalence was 6% during the initial 7-week surge in France. Compared with COVID-19 incidence estimates of 0.2% in the general population, 3.3% of patients receiving dialysis nationwide developed COVID-19, with a nearly 2-fold greater risk among patients receiving in-center hemodialysis as compared to patients receiving home dialysis. Critically, the regional incidence of COVID-19 among patients treated with dialysis mirrored the regional incidence in the general population, suggesting a major role for the impact of community spread on infection in patients treated with dialysis. Mortality among patients receiving dialysis who have COVID-19 was approximately 20%.⁶

Ten months after the emergence of coronavirus disease 2019 (COVID-19), it continues to devastate health and livelihoods worldwide. September 28, 2020, witnessed the bleak milestone of 1 million deaths

Table 1 | Strategies to reduce the risk of SARS-CoV-2 transmission among patients receiving maintenance dialysis**Within dialysis facilities**

Universal mask use among patients and staff
 Routine screening for symptoms of or exposure to COVID-19
 Specified treatment areas and protocols for those who screen or test positive
 Reduced crowding in waiting rooms and staff break rooms
 Testing asymptomatic patients and staff in times of higher community prevalence

During transportation to and from dialysis

Reduction of shared rides
 Mandated sanitation protocols

Within the community

Engagement and education of patients and families on risk and risk mitigation
 Expanded testing in high-risk settings (e.g., congregate residences and neighborhoods with high community prevalence)

COVID-19, coronavirus disease 2019; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

This mortality figure is confirmed by Jager *et al.*,⁷ who, reporting from the European Renal Association—European Dialysis and Transplant Association (ERA-EDTA) Registry, note an approximately 20% mortality rate due to COVID-19 among both patients receiving dialysis and kidney transplant recipients, a rate that is dramatically higher than the estimated 4% mortality rate overall in Europe among people diagnosed with COVID-19.¹ The third study, by Ng *et al.*,⁸ describes the experience of a health system in New York at the height of the first COVID-19 surge, noting that among 419 patients receiving maintenance dialysis who were hospitalized with COVID-19, 32% died, with a 37% higher adjusted risk of death among patients receiving dialysis who were hospitalized than other patients who were hospitalized with COVID-19. Taken together, these studies demonstrate the high COVID-19 risk for patients requiring maintenance dialysis, both for acquiring infection and, especially, for poor outcomes once infected, with short-term mortality that is likely to be 20% or higher.

In Europe and much of Asia, aggressive steps were taken to control the spread of COVID-19 in the general population, with institution of mandatory physical distancing policies in times of high community spread, implementation of mandatory masking

policies, and broad availability of contact tracing and testing, including among asymptomatic individuals, with resultant substantial reductions in mortality. In the United States, implementation of and adherence to public health measures have been inconsistent, with the result that the United States still averaged more than 40,000 new cases per day and 750 deaths per day due to COVID-19 in September 2020, 6 months after the initial surge in New York.¹ The US experience, with ongoing regional surges and highly variable adoption of precautions against COVID-19 transmission, highlights that the threat posed by COVID-19 persists and that ongoing sensible steps to limit transmission are critical to protect all people, particularly vulnerable patients receiving maintenance dialysis. Therefore, the kidney community must consider how to manage our patients through potentially overlapping scenarios: prolonged, sustained presence of the virus in the community for months to come and additional surges that again test the limits of existing health systems.

The kidney community, particularly dialysis providers and patients receiving dialysis, must remain vigilant. Interventions to mitigate the impact of COVID-19 among the dialysis population apply to 3 key settings: the dialysis center, transportation to and from the dialysis center, and the communities in which patients who are treated with dialysis live (Table 1).⁹ Within dialysis facilities, reasonable precautions can decrease the risk of transmission and facilitate care of patients receiving dialysis who have COVID-19, thereby reducing the need for hospitalization and the burden on hospital systems.¹⁰ These include universal mask use among patients and dialysis staff, screening and triage to help identify and rapidly cohort patients with symptoms of or exposure to COVID-19, reduced crowding in hemodialysis facilities including in waiting rooms and staff break rooms, specified treatment areas and protocols for providing hemodialysis to patients under investigation for or with COVID-19, and, in times of higher community prevalence, testing asymptomatic

patients requiring maintenance dialysis as well as dialysis staff for COVID-19. Critically, dialysis facilities should anticipate a continued need for increased physical space and staffing capacity while the pandemic persists, particularly in areas of ongoing community transmission. Patients need education that they remain at high risk and that the easing of physical distancing guidelines poses greater risk to them. Transportation to and from dialysis varies greatly around the world; nevertheless, reducing shared rides and mandating sanitation protocols can reduce infection. Lastly, many patients requiring maintenance dialysis reside in high-risk communities, such as densely populated urban areas or congregate residences such as nursing facilities;^{11,12} awareness of the risk posed in these settings and expanded testing of individuals residing in high-risk settings can reduce the threat of COVID-19 both to these patients and to the broader dialysis population.

Given the poor outcomes among patients treated with dialysis who have COVID-19, prevention is our best weapon. Critically, the kidney community needs to advocate for inclusion of patients treated with dialysis and patients who have received kidney transplants in trials of COVID-19 vaccines. The pandemic also has reinforced the critical need to increase treatment of kidney failure with home dialysis and kidney transplantation, modalities that substantially enhance the ability of patients with kidney disease to physically distance.

Improving outcomes among patients receiving maintenance dialysis who have COVID-19 remains difficult, with management largely supportive. We witnessed the critical need for resource management in April 2020 when the surge in New York City led to shortages of dialysis machines, consumables, and staff.¹³ Similar experiences occurred in Italy and elsewhere. In patients hospitalized with COVID-19, the high rate of acute kidney injury requiring dialysis superimposed on the already high hospitalization rate of patients receiving maintenance dialysis who

have COVID-19 can strain health care systems beyond capacity. In the United States, this has been magnified by the high prevalence of COVID-19 in nursing homes and rehabilitation facilities, resulting in prolonged hospitalizations and greater inpatient demands for dialysis. Even beyond a surge, dialysis providers must ensure sufficient availability of resources and vigilance regarding COVID-19 risk as dialysis-dependent patients transition across health care settings.

In conclusion, the studies published in this issue of *KI* highlight not only the high risk of developing COVID-19 among patients receiving in-center hemodialysis but also the severe consequences of COVID-19 in this population, with 20% mortality among patients receiving maintenance dialysis who have COVID-19. Until the pandemic is controlled, the kidney community needs to aggressively pursue infection control and appropriate resource management to optimize outcomes in this vulnerable population.

DISCLOSURE

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A *Kidney International* “journal of the COVID-19 year” in kidney transplantation



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The global coronavirus disease 2019 pandemic's impact on kidney transplant recipients and transplantation programs in the calamitous months of February to June 2020, spring to summer in the Northern Hemisphere, is represented in articles published in the December issue of *Kidney International*. Writing about another pandemic in the year of 1665 over 300 years ago, the author Daniel Defoe¹ describes the same period of time in London and gives a remarkably familiar description of how a pandemic affects populations, including the unproven treatments, epidemiology of infection, and human response to restrictions on freedom of city lockdowns that occurred during that time. The risks, outcomes, epidemiology, and potential treatments for the kidney transplant population worldwide during the past 12 months have been thankfully studied in detail by multiple investigators and form the subject of papers in *KI* this month.

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see basic research on page 1502 and clinical investigations on pages 1540, 1549, 1559, and 1568

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First, from Europe comes the registry experience of Calliard *et al.*² who describe the clinical presentations of 279 kidney transplant recipients reported to the French nationwide registry of Solid Organ Transplant COVID Recipients. Risk