Beware the Ides of March: A Fellow’s Perspective on Surviving the COVID-19 Pandemic

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KIDNEY360 1: 1316–1318, 2020. doi: https://doi.org/10.34067/KID.0005442020

Introduction

As I hit the snooze button on my alarm at 6:00 AM, I was wide awake. Anxiously, I refreshed the “COVID stats” website in my bookmarks to check the number of new cases and deaths that COVID-19 had claimed in the past 24 hours. This became a grim routine: I started my day keeping track of statistics and going to bed hoping that the next day those numbers would take a turn.

In retrospect, the few months prior to March 2020 felt like watching a tsunami in slow motion before it made landfall in New York City. From a couple dozen cases in the Far East to thousands of cases in Europe, coronavirus disease 2019 (COVID-19) swept across the globe, quickly making headlines as it gained momentum and was deemed a pandemic. Faced with one of the greatest health crises since the Spanish flu in 1918, health care providers and hospital systems were forced to adapt to the new challenges inherent to the pandemic. In a fortnight, the hospital layout was practically unrecognizable, with new makeshift rooms constructed in every available space to accommodate the massive patient influx. Days seemed to blend into nights as house staff battled challenges of dealing with a dangerous new disease entity as they worked long hours draped in personal protective equipment, which was being rationed.

As nephrology fellows in a major tertiary care center in New York City, our training, let alone our lives, have forever been altered by this crisis. As we reflect on the experiences and challenges during these past months, the storm seems to have washed over our city but is nowhere near dissipated from the world.

Approach to New Consults during COVID-19 Pandemic: Seems Like It Is All COVID-19 Now

As we braced for the infiltration of severe acute respiratory syndrome coronavirus 2 into our community, we grappled for data from affected countries that would give us insight on the effect of the virus on the kidneys and subsequently place us at a vantage point in the upcoming battle. Our division faculty held twice weekly Zoom meetings in preparation and took it upon themselves to organize international conferences to learn from our colleagues in Italy about the crucial role that nephrologists played in the management of patients with COVID-19. A few patient series from China reported variable incidence of AKI in patients with COVID-19, with an incidence of 23% in the critically ill (1).

Toward the end of March, as the numbers of patients with COVID-19 increased in our hospital, the numbers of renal consults related to the viral infection rose in parallel. We can recall a time in early April when the renal service had approximately 180 patients, more than double the average census, and essentially all new consults were related to COVID-19 AKI. It quickly became apparent that the incidence of AKI was higher in our community compared with reports from abroad. Our initial clinical suspicions and anecdotes were confirmed later when the clinical investigators from our center and others in New York City reported that the incidence of AKI in patients hospitalized with COVID-19 was between 37% and 46% (2,3) (Chan L, Chaudhary K, Saha A, Chauhan K, Vaid A, Baweja M, Campbell K, Chun N, Chung M, Deshpande P, Farouk SS, Kaufman L, Kim T, Koncicki H, Lapsia V, Leisman S, Lu E, Mелиямброп K, Menon MC, Rein JL, Sharma S, Tokita J, Uribarri J, Vassalotti JA, Winston J, Mathews KS, Zhao S, Paranjpe I, Somani S, Richter F, Do R, Miotto R, Lala A, Kia A, Timsina P, Li L, Danielelto M, Golden E, Glowe P, Zweig M, Singh M, Freeman R, Chen R, Nestler E, Narula J, Just AC, Horowitz C, Aberg J, Loos RJF, Cho J, Fayad Z, Cordon-Cardo C, Schadt E, Levin MA, Reich DL, Fus ter V, Murphy B, He JC, Charney AW, Bottinger EP, Glicksberg BS, Coca SG, Nadkarni GN: Acute kidney injury in hospitalized patients with COVID-19. medRxiv 10.1101/2020.05.04.20090944, 2020). These numbers surpassed those reports from our European and Asian colleagues.

It was mind boggling how the AKI associated with COVID-19 infection had variable presentations ranging from bland urinalysis to new-onset heavy proteinuria and hematuria. Nonetheless, we labeled this new entity as “COVID-19 AKI,” with the one unifying characteristic among patients being the aggressiveness of the disease. With scarce data to guide our management, we attempted to describe the characteristics of the disease as best as we could and tried to identify patterns of its presentation. We noted markedly elevated serum creatinine values either on admission or...
24–48 hours prior to rapid decline in a patient’s respiratory status. The vast majority had metabolic disturbances similar to hypercatabolic states seen in tumor lysis syndrome or rhabdomyolysis, with only a handful of patients with substantially elevated creatine phosphokinase values (4). Some patients responded to volume expansion, and others responded to diuretic challenges; however, the general trend observed was a rapid progression of kidney injury with short intervals between development of AKI and need for KRT.

A series of biopsy reports subsequently elucidated that there was no single etiology of AKI in patients with COVID-19. Despite virtually all patients having some degree of tubular injury, some developed glomerular injuries related to collapsing variant of FSGS and minimal change disease, as well as ischemic glomerular damage secondary to fibrin thrombi formation (5,6). Regardless, the disease course for many was fulminant, with little time for biopsies or kidney-directed treatments beyond supportive care and KRT.

Managing High Hospital Demands for KRT: How We Overcame the Storm

We all had a role to play during the COVID-19 pandemic. Some of our colleagues were deployed to help out on COVID-19 floors; however, given the high demand for kidney care in our hospitalized patients, the majority of the faculty members were needed for the clinical work on the nephrology services. Six attendings came in on weekends, compared with the normal two (nontransplant and transplant attending). Similarly, weekend calls were restructured to off-load the on-call teams. Our dialysis nurses valiantly spearheaded the efforts to overcome the storm as they donned suffocating personal protective equipment and worked in close proximity to infected patients to ensure treatments were completed in a timely manner. Unfortunately, the biggest limitation to our “all-hands-on-deck” strategy was our own vulnerability to COVID-19. Fellows, faculty, and nurses fell ill, with colleagues selflessly stepping in to take over their responsibilities.

Despite bracing for the high occurrence of AKI requiring KRT, the equipment and manpower still fell short of the needs. The various consult teams and nursing staff worked together on a daily basis to triage patients requiring KRT on the basis of severity of indication. Our inpatient dialysis unit transitioned from hosting one shift dedicated to patients with COVID-19 to an all-COVID-19 unit with a handful of patients with ESKD without COVID-19 dialyzed in an isolated area during the morning shift. To reduce the risk of hyperkalemia that would require emergent dialysis, we prophylactically initiated patients with AKI or ESKD on potassium binding resins if their potassium level was >5.0–5.5 mEq/L. Dialyzers were up sized, and treatment times were reduced to allow for an increased number of dialyzed patients in a 24-hour period. We also noticed a disturbing trend where circuit and access clotting was occurring at astronomical rates, resulting in insufficient solute clearance due to poor blood flow. The strategy of using systemic anticoagulation, after implemented, helped alleviate this issue. As for the critically ill patients who required continuous RRT, there were days when the number of patients surpassed the number of available machines. To overcome this issue, patients were placed on a prolonged intermittent treatment over 12 hours, and aquapheresis was utilized to further assist with volume removal as indicated.

With our services operating above capacity and our resources exhausted, the department had no choice but to resort to creativity. Of all of the interventions implemented to decompress our service, the most effective was our acute peritoneal dialysis (PD) initiation. Heretofore, this strategy was rarely utilized in hospitalized patients with AKI (7), but during the COVID-19 surge, acute PD was our saving grace. In a daring effort over the course of 1 month, the acute PD program was able to start 21 patients on this modality.

Adjustments to Fellowship Education: Utilization of Virtual Learning and Telemedicine

In some ways, the pandemic pushed us further into the twenty-first century. Digital platforms became essential not only for the continuity of patient care but also, for the endurance of our education. A cohort of fellows was tasked to transition patients’ in-person clinic visits to virtual visits, and only a handful of critical patients were seen in the clinic. Telemedicine, once an underutilized resource, allowed us to continue caring for our patients safely. Several months after the quarantine in New York City was lifted, this platform remains an integral part of our clinic practice nowadays and has contributed to a decrease in the number of clinic visit no-show rates.

To accommodate the high volume of consults during the peak of the pandemic, academic activities were suspended, and the time was allocated to patient care. As the number of patients reached a plateau and we were better adapted to managing the patient census, educational conferences were resumed via Zoom. After trial and error of open microphones and pixelated screens, we finally have almost “mastered” the new art of teleconferences. Initially, lectures were focused on management strategies for COVID-19 AKI and associated complications. Shortly thereafter, lectures pertaining to our training curriculum were slowly reinstated.

The Moral

As Rutger Bregman wrote in Humankind, “Catastrophes bring out the best in people.” Surviving the COVID-19 pandemic in New York City was the greatest test to this truth. The physical toll and the emotional rollercoaster of battling a novel disease entity that was ravishing lives unapologetically were humbling to say the least. It seemed that with all of the advances that humanity had reached in the twenty-first century, we ultimately felt defeated by a microscopic organism. It is with the courage, determination, and unanimous efforts of everyone involved that we were able to survive the Ides of March. Like a squadron of soldiers who fought together in war, the crisis united our division closer than ever before. Hierarchies of traditional academic medicine were flattened, as the fellows, clinician educators, and physician-scientists all unified in mind, body, and spirit to handle the enormous clinical and psychologic burden induced by COVID-19.

Disclosures

All authors have nothing to disclose.
Funding
None.

Acknowledgments
We would like to acknowledge the extraordinary efforts undertaken by the Division of Nephrology at Mount Sinai Hospital. We are forever grateful for the dialysis nurses and staff at the Mount Sinai Kidney Center and Home Dialysis Unit for their dedication and herculean efforts. Special thanks to Dr. Steven Coca for trusting us to share this experience and for helping review our final manuscript. Lastly, we would like to dedicate this perspective piece to our families and co-fellows for all their work and support during these challenging times. The content of this article reflects the personal experience and views of the author(s) and should not be considered medical advice or recommendation. The content does not reflect the views or opinions of the American Society of Nephrology (ASN) or Kidney360. Responsibility for the information and views expressed herein lies entirely with the author(s).

Author Contributions
N. Fuca, J. Hindi, and L. Sanchez Russo wrote the original draft; and N. Fuca, J. Hindi, and L. Sanchez Russo reviewed and edited the manuscript.

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Received: September 14, 2020 Accepted: September 23, 2020

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