

COVID-19 and Impending Shortage of Haemodialysis Facilities due to the Rising Incidence of Acute Kidney Injury Requiring Renal Replacement Therapy

Sir,

Around the globe, nations are striving hard to combat the pandemic of COVID-19, which is ruthlessly engulfing precious lives of humankind, ranging from neonates to geriatric individuals with no discrimination of gender, race, ethnicity, religion or geographical boundaries. Human beings have survived numerous pandemics in the past, like swine flu, ebola, and polio etc; but COVID-19 has had the worst economic impact pushing the world back by decades.

COVID-19 spreads from one individual to the next through direct contact, hand shaking, touching surfaces contaminated with the virus via tiny respiratory droplets of the infected individuals. Due to its highly contagious nature and spread, there is a huge surge in demand of personal protection equipment (PPE) throughout the world and, more so, in the healthcare settings, where healthcare providers are on the frontline. Despite being at most risk due to direct contact with suspected or diagnosed patients, huge shortage of PPE is being observed even in resource-rich countries.

The disease process of COVID-19 presents with the most common respiratory symptoms including cough, shortness of breath and complicating acute respiratory failure, even requiring the assistance of mechanical ventilation in most severe cases. This has led to the global shortage of medical equipment, including both ventilators and non-invasive respiratory support devices to supply oxygen to the compromised lungs. Low cost, urgent use ventilators are being designed and are under human trials to cope with the rising demand in the intensive care units.

With the rising number of cases, there has been a great deal of discussions on the shortage of medical equipment, ICU beds, PPEs and ventilators, and its impact on patient care. It must be kept in mind that, although the respiratory symptoms of COVID-19 are easily recognizable when a patient is seen in triage, the lungs are not the sole organ affected by the virus. The increase in patients with multi-organ failure, particularly kidney failure, requiring acute dialysis, poses another challenge to the system. This may overwhelm our dialysis units and impose a huge burden on the already suffocating health system.¹

The incidence of kidney failure in some critical care units is so high that units are running short of haemodialysis personnel, machines and other consumables. They are also scrambling to maintain access to renal replacement therapy for routine haemodialysis patients because of possible development of dialysis equipment shortage.² This has recently been observed in New York, where looking beyond the requirement of ventilators, one-third of ventilated patients are requiring dialysis and flooding the already suffocating health system.³ In resource-poor countries like in Pakistan, we are already facing and struggling with equipment shortage such as dialysis machines.

There is positive correlation between kidney injury, i.e. kidney failure and mortality in COVID-19 patients with more intensive care requirement; studies show that approximately 13% of patients had underlying kidney disease, above 40% had evidence of abnormal kidney function, and 5.1% had acute kidney injury (AKI) during their hospital stay. Mortality was higher in those with advanced stages of AKI, and even more than four-folds higher in AKI stage 3.⁴

However, with the following proactive strategies, we may help mitigate the effects it may have on our system, if applied in a timely manner.^{2,4}

As many COVID-19 patients present with dehydration secondary to insensible fluid losses due to high grade fever and the notion of keeping lungs dry (to bring the respiratory symptoms under control), patients are at risk of developing kidney injury. Special attention is warranted in timely identifying risks, serial clinical assessment for fluid status, urine output measurement, and daily monitoring of renal functions of those with previous comorbidities (e.g. chronic kidney disease, prior transplant, diabetes mellitus, cardiac failure), or taking nephrotoxic drugs (e.g. non-steroidal anti-inflammatory drugs, blood pressure lowering drugs, diuretics) are mandatory in early identification of renal involvement.

Once renal involvement is identified, earlier interventions to provide maximal medical supportive therapy and avoidance of further renal insults, by keeping patient well hydrated and avoiding or minimizing nephrotoxic drug therapies during hospital stay, may help avoid advanced AKI.

Given the high incidence of patients developing AKI, above strategies must be accompanied by availability of haemodialysis machines and staff within Intensive care units, because of potential spread of COVID-19 virus once such patients are shifted to haemodialysis units for therapy.

Above all, it is highly recommended to get earlier input of nephrologists in more precise decision-making. By applying principle of "prevention is better than cure", we can help in reducing mortality.

CONFLICT OF INTEREST:

Authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:

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