COVID-19 in Hemodialysis: A Prospective, Observational, Single-Center Data From Eastern India

Dear Editor,

End-stage renal disease (ESRD) patients on maintenance hemodialysis (MHD) with high comorbidities are unable to follow social distancing logistically, are affected more, and suffered worse outcomes compared with the general population. As reported Indian data are limited and outcomes are not uniform across countries, we tried to analyze the binary outcome data: death/discharge in ESRD on MHD patients admitted in a dedicated COVID-19 (coronavirus disease 2019) hospital in Kolkata and report the risk factor associated with the poor outcome.

We recorded a questionnaire-based responses from 87 consecutive participants with ESRD on dialysis, diagnosed with COVID-19, and admitted in a COVID-19-dedicated hospital in Kolkata, from May 2020 to mid-July 2020. Treatment details and outcome, death or discharge for all patients were collected from the hospital records. Patients were admitted in the ward or intensive care unit (ICU) or shifted to the ICU based on protocolized treatment plan. All patients were managed as per the management protocol available on the MOHFW (Ministry of Health and Family Welfare) website (www.mohfw.gov.in). Patients received IHD (intermittent hemodialysis) or SLED (sustained low-efficiency dialysis), as per need; however, no patient received hemodiafiltration, CRRT (continuous renal replacement therapy), or ECMO (extracorporeal membrane oxygenation). HFNO (high-flow nasal oxygen) via NRBM (nonrebreather mask), NIV (non-invasive ventilation), and mechanical ventilation was offered after clinical and ABG (arterial blood gas) evaluation by critical care physician. No patient received remdesvir, lopinavir, ritonavir, or tocilizumab. Steroid (methylprednisolone 1–2 mg/kg body weight) was used in sick patients in ICU.

Descriptive statistical analysis for categorical variables was done by percentage. Central tendency for continuous variables were expressed as mean/median (depending on

Table 1: Comparison of parameters between survivors and nonsurvivors

Characteristics	Survivors (*n*=68)	Nonsurvivors (*n*=8)	*P*
Male/Female	49/19	6/2	NS
Age (years)	52.0 (46.0-67.0)	67.50 (56.25-70.0)	0.031
Dialysis vintage (months)	24.0 (10.0-36.0)	36.0 (13.50-42.0)	NS
Family members affected	3 (4.41)	0 (0)	NS
Hypertension	56 (82.35)	8 (100)	NS
Diabetes mellitus	22 (32.35)	6 (75)	0.048
Ischemic heart disease	10 (14.71)	4 (50)	0.034
Cerebrovascular accident	1 (1.47)	1 (50)	NS
COPD	5 (7.35)	2 (25)	NS
Smoking	22 (32.35)	4 (50)	NS
Symptomatic	21 (30.88)	6 (75)	0.021
Tachycardia	19 (27.94)	4 (50)	NS
Tachypnea	24 (35.29)	5 (62.5)	NS
Hemoglobin (g/dL)	8.50 (7.72-9.58)	8.75 (6.50-9.74)	NS
Total leucocyte count (number/mm^3)	6600.0 (4975.0-8637.5)	6300.0 (3025.0-10775.0)	NS
Leucocytosis	9 (13.23)	2 (25)	NS
ANC >1,500/mm^3	54 (79.41)	4 (50)	0.085
Lymphopenia	23 (33.82)	5 (62.5)	NS
CRP (mg/L)	4.20 (3.23-8.75)	22.0 (6.50-47.0)	0.008
Raised CRP	18 (26.47)	7 (87.5)	0.001
Procalcitonin (ng/mL)	2.70 (0.89-20.0)	29.50 (6.50-47.0)	0.006
Raised Procalcitonin	26 (38.23)	6 (75)	0.063
Coagulopathy	21 (30.88)	3 (37.5)	NS
D-dimer (ng/mL)	339.50 (250.0-1500.0)	560.0 (272.5-1575.0)	NS
Raised D-dimer	29 (42.64)	4 (50)	NS
Acute Liver Injury	17 (25)	1 (12.5)	NS
ARDS	12 (15.79)	6 (75%)	0.002

COPD=Chronic obstructive pulmonary disease, ANC=absolute neutrophil count, CRP=C-reactive protein, ARDS=acute respiratory distress syndrome, NS=not significant

the results of test of normality). Nonparametric tests such as Mann–Whitney *U* test were performed for comparing the continuous data between post-COVID-19 infection survivors versus non-survivors. Chi-square test or Fisher's exact test was performed for comparing categorical data between post COVID-19 infection survivors versus non-survivors. All statistical analyses were performed using SPSS software Version 21.

Total patients admitted during the study period with SARS-CoV2 infection was 87, excluding those with superadded bacterial/fungal infection. Out of them, 76 patients had an outcome. Sixty-eight patients (89.47%) were discharged and eight (10.53%) died. Out of 76 participants, 55 (72.37%) were male and 21 (27.63%) were female. 49 (64.5%) patients were asymptomatic (64.5%). Symptomatic patients (35.52%) had fever with dry cough as the commonest presentation. ICU admission was needed in 18 patients (23.68%), and 12 (15.78%) required invasive mechanical ventilation. Two patients came out of mechanical ventilation and survived, whereas two non-ICU patients died in the ward.

Symptomatic COVID-19 infection, smoking and ischemic heart disease (IHD), lymphopenia, and raised CRP were the risk factors predictors of ICU admission. Mortality had been significantly associated with diabetes, IHD, old age, symptomatic disease, ARDS, raised CRP and procalcitonin [Table 1].

In comparison with the outcomes reported in various studies, our study has found lesser mortality (10.52%). Higher mortality was reported from Spain (29%) and the United States (31%).[1,2] The United States[1] reported Charleson comorbidity index and older age to be associated with higher mortality, whereas Spain[2] reported it to be associated with higher LDH, CRP, and worse pneumonia. We looked at the baseline characteristics of our cohort that differ from the cohorts reported from other countries. Our patients were younger (mean age 54 years), with higher dialysis vintage, had diabetes (38.16%) much less compared with Spain (64%), but similar with reports from China (22.9%).[3]

Small number of outcome events and single-center data are the limitations of the study, whereas prospective enrolment and planned follow-up without missing data are the strengths of our study.

The impaired immune response associated with the uremic state may explain the occurrence of reduced fever and asymptomatic state in the dialysis-dependent population.

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Conflicts of interest

There are no conflicts of interest.

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