Clinical Course and Management		
		n (%)
Symptomatic (n=52)	Cough	22 (37.9)
	Fever	20 (34.5)
	Abdominal pain	15 (25.9)
	Shortness of breath	13 (22.4)
	Diarrhoea	12 (20.7)
Disease Category	Category 1 (Asymptomatic)	6 (10.3)
	Category 2 (Symptomatic with no pneumonia)	9 (15.5)
	Category 3 (Symptomatic with pneumonia)	10 (17.2)
	Category 4(Pneumonia requiring oxygen support)	27 (46.6)
	Category 5 (Multiorgan involvement/requiring non-invasive ventilation/intubation	6(10.3)
Treatment	Favipiravir	17(29.3)
	Corticosteroid	36(62.1)
	Antimicrobials	37(63.8)

The median length of hospital stay was 12 ± 13 days. Complications noted during hospitalizations were acute coronary syndrome (n =6), peritonitis (n= 5), pulmonary embolism (n=2), secondary bacterial infection (n=4) and fungal infection (n=1).

From this cohort, 56.9% (n=33) had severe disease (Category 4 and 5) and overall in-hospital mortality rate was 43.1% (n= 25). Milder form of Covid-19 (Category 1-3) and full vaccination status were associated with significant reduced mortality outcome p=0.003 (OR 0.091; 95% CI 0.02-0.44) and p=0.003 (OR 0.066; 95% CI 0.01-0.41) respectively.

Conclusions: Covid-19 infection in PD population carried high mortality rate. Mild disease upon presentation and complete vaccination had statistical correlation with lower in-hospital mortality.

No conflict of interest

POS-959

CLINICAL PROFILE AND OUTCOME OF SARS-COV2 INFECTION IN RENAL TRANSPLANT RECIPIENTS - A SINGLE CENTRE EXPERIENCE

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Introduction: Kidney transplant recipients (KTR) form a vulnerable population group as they are on chronic immunosuppression and have comorbidities like diabetes. Previous studies have shown increased mortality of renal transplant patients infected with SARS-CoV2 infection compared to the general population. We compared the clinical presentations of renal transplant patients infected with SARS-CoV2 in the first and second wave from a large tertiary care centre of South India. Our study aims to analyze the clinical profile, impact on graft function and outcome of KTR infected with SARS-CoV2 and to find the long term effect of SARS-CoV2 infection in this subset of population.

Methods: In this prospective observational study all KTR infected with COVID-19 confirmed by Reverse Transcription Polymerase Chain Reaction (RT-PCR) were included since the beginning of the outbreak. Patients who contracted infection in the first wave (March 2020 - February 2021) were compared with those who were infected in the second wave (March 2021- June 2021). They were followed up until August 2021.

Results: The study included a total of 129 KTR, of whom 72(55.8%) patients were admitted in the first wave and 57 (44.1%) patients in the second wave. Graft dysfunction was seen in 89 (68.9%) patients. Graft dysfunction was higher in second wave (78.9%) when compared to the first wave (61%) [p=<0.001]. The median age of the study group was higher in first wave (p=0.02). Sixty six (51%) patients had severe disease among the KTR admitted. The disease severity was higher in second wave compared to the first (p=0.03). The second wave was also complicated by post covid rhinocerebral mucormycosis among five of the renal transplant patients who were diabetic. Twenty six (20.1%) KTR died of acute covid infection. Nine patients (12.5%) died in the first wave and 17 (29.3%) patients in the second wave. The mortality was significantly higher in the second wave when compared to the first (p=0.03).

Follow up

The median duration of follow up was 124 (30-244) days. Seventy four (71.8%) patients were followed up. Fifty one (81%) patients from the first wave and twenty three (40.3%) patients from the second wave were followed up. Twenty patients (19.4%) had persistent graft dysfunction. Eight (7.8%) patients underwent renal allograft biopsy of whom three patients had graft pyelonephritis, three had acute cellular rejection, one patient had antibody mediated rejection and one patient combined acute cellular and antibody mediated rejection. Seven (6.7%) patients died during follow up.

Table 1 . Demographic Characteristics of the study population

Characteristics	Total	First wave	Second wave	P value
No of patients n(%)	129	72(55.8%)	57(44.1%)	
Sex male n(%)	109	58(80.5%)	51(89.4%)	0.20
Age median(IQR)	40(32-49)	42(33-55)	39(30.1-46)	**0.02**
NLR median (IQR)	6.5(4.2-13.0)	6.5(4.1-12.6)	5.4(4.3-14.7)	0.87
CRP(mg/dl) median (IQR)	36.5(14.2-90.7)	31.7(12.6-63.9)	41(17-113)	0.33
Baseline creatinine(mg/dl) (mean ±SD)	1.7(±1.03)	1.7(±0.07)	1.7(±0.44)	0.38
Diabetes mellitus including NODAT n(%)	54(41.8%)	19(26.4%)	25(43.1%)	0.09
Hypertension n(%)	44(34.1%)	23(32%)	21(37%)	0.87
Duration since transplant (months) (median)[IQR]	60(34-102))	60(24-120)	60(36-92)	0.46
LRRT/DDRT n	88/33	57/14	31/19	
Duration of hospitalization(in days) median[IQR]	9(6-14)	8.5(6-14)	10(6.8-17.8)	0.48
Severe disease n(%)	66(51.1%)	30(42%)	36(63%)	**0.03**
Oxygen requirement n(%)	64(49.6%)	30(42)%	34(60%)	0.18
Symptomatic at presentation n(%)	123(95.3%)	66(91%)	57(100%)	**0.015**
Graft dysfunction at hospitalization n(%)	89(68.9%)	44(61%)	45(78.9%)	**<0.001**
Death at hospitalization n(%)	26(20.1%)	9(12.5%)	17(29.3%)	**0.03**

Conclusions: The mortality, severity of infection and graft dysfunction of KTR infected with SARS-CoV2 were higher in the second wave compared to the first wave. Renal allograft biopsy performed on SARS-CoV 2 infected KTR during follow up showed acute cellular rejection, antibody mediated rejection and graft pyelonephritis.

No conflict of interest

POS-960

ASSOCIATION OF PARATHYROID HORMONE LEVEL WITH SEVERITY OF CORONAVIRUS-INDUCED PNEUMONIA IN HEMODIALYSIS PATIENTS

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Introduction: Hemodialysis (HD) patients are at high risk of coronavirus disease (COVID-19) infection and related adverse outcomes compared to the general population. Severe pneumonia is one of the main factors closely associated with the high mortality rate in COVID-19 infected patients. Secondary hyperparathyroidism has been demonstrated to negatively impact the clinical outcome of COVD-19-associated pneumonia. However, there is still a general lack of data on the association between parathyroid hormone (PTH) status and COVID-19-associated pneumonia severity in HD patients.

Methods: A total of 142 HD patients, aged 52 ± 11.4 years and confirmed cases of COVID-19 infection, were enrolled in this multicenter retrospective cohort study focusing on the association between chest computed tomography (CT) findings and serum PTH concentrations. The data were collected by reviewing electronic health records of the dialysis centers. The PTH levels were collected at baseline (the last measurement before the COVID-19 onset). Severity of pneumonia was estimated based on CT findings of pulmonary involvement and assessed using the following scoring system: 1 indicating less than 5% involvement, 2 indicating 5–25% involvement, 3 indicating 26–49% involvement, 4 indicating 50–75% involvement, and 5 indicating more than 75% involvement.

The data presented as the median and the interquartile ranges [Me (Q25-Q75)]. The receiver operating characteristic (ROC) analysis was

performed to determine the optimal cut-off point of PTH concentration for predicting severe COVID-19-associated pneumonia in HD patients.
Results: Out of the 142 HD patients with COVD-19-associated pneumonia, 108 (76%) patients did not require any oxygen support, 40 (28%) were hospitalized and 34 (24%) of them needed oxygen supplements. The Chest CT findings in almost all HD patients (99.3%) were scored from 1 to 4 and the only patient had 75% pulmonary involvement. The baseline PTH level was significantly lower in patients with severe COVD-19-associated pneumonia compared with those with mild and moderate pneumonia scores (Fig. 1).

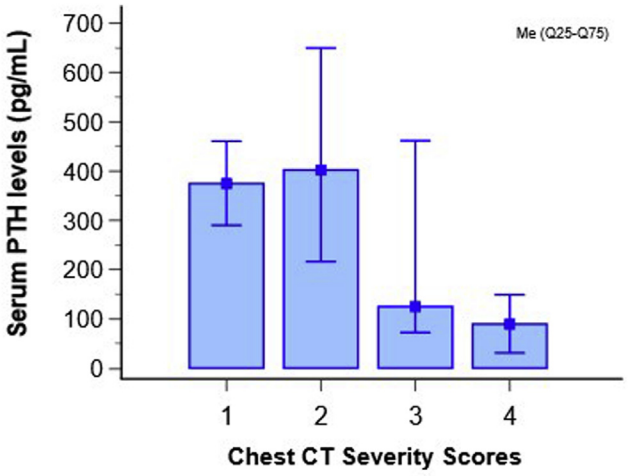

Fig. 1. Serum PTH levels according to the chest CT severity scores in COVID-19 infected HD patients (Kruskal-Wallis test, p = 0.01).

The overage PTH level in oxygen-dependent HD patients was statistically lower than in oxygen-independent HD patients [125.0 (64.3-462.0) vs 421.5 (271.0-658.0) pg/mL (p = 0.0007)]. Moreover, our results showed a significant correlation between baseline serum PTH level and CT severity score (r = -0.37, p = 0.003). The ROC analysis found that the most appropriate cut-off point for baseline PTH concentration as a predictor for severe COVD-19-associated pneumonia in the HD patients was ≤174 pg/mL with sensitivity of 69.3 % and specificity of 84.5 %. The area under the ROC curve was 0.74 (95% CI 0.62; 0.84), p = 0.0004.
Conclusions: PTH concentration ≤174 pg/mL was significantly associated with severe COVID-19-associated pneumonia in our cohort of HD patients. Further researches with a greater cohort are needed to confirm this preliminary evidence and to validate PTH level as a proposed biomarker in clinical practice.

No conflict of interest

POS-961

INCREASED RISK OF EXTRACORPOREAL CIRCUIT CLOTTING IN HAEMODIALYSIS PATIENTS WITH COVID 19

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Introduction: Coronavirus disease 2019 (COVID-19) is known to associate with increased thrombotic events. Intensive care units(ICU) have reported increased clotting of continuous renal replacement(CRRT) circuits in covid-19 patients with acute kidney injury. This has led to significantly reduced filter half-life requiring frequent troubleshooting and exposing the staff to patients infected with COVID 19 in addition to inadequate dialysis, blood loss and increase health care cost.

Therefore, we conducted a study to determine whether haemodialysis(HD) patients with covid-19 had an increased risk of extracorporeal circuit clotting(ECC), and if this was predominantly due to an increase in procoagulant factors, or due to a reduction in anticoagulants.

Methods: An observational cohort study of 203 HD patients with confirmed COVID 19 infection between April 2020 and June 2021 was conducted in a teaching hospital in the UK. Selected patients were observed for ECC and bleeding at vascular access sites over a period of four weeks after a positive COVID-19 test. Patients who had clotting abnormalities within 4 weeks prior to positive COVID 19 test were excluded from the study. Clotting studies were done as part of routine care in dialysis patients. Patient co-morbidity was assessed using the Charlson co-morbidity score. Patients were divided into three groups, who had clotting of dialysis circuits, patients with bleeding at vascular access sites, and those with no complications. Standard statistical analyses were used to identify variables associated with clotting of dialysis circuits.
Results: Sixty-three (31.0%) of 203 HD patients with covid-19, 65% male, mean age 64.9±15.3 years, experienced ECC. There were no differences in patient demographics; age, gender or co-morbidity between groups. Over-all mortality among groups remained similar.Markers of inflammation; CRP, ferritin and NTproBNP concentrations were not different between groups but more patients with ECC had a raised CRP compared to those without complications.

No statistically significant difference was noted in prothrombin, activated partial thromboplastin or thrombin times among study groups. Patients who had clotting had greater FVIII (p<0.001)(Figure1), D-Dimers (p< 0.05), and fibrinogen (p<0.05) levels(Table 1). Anticoagulants; antithrombin, protein C, protein S and platelet counts were not different among groups. Only two patients detected to have factor V Leiden and neither of them were tested positive for lupus anticoagulant. None of the patients were positive for PTR-3'UTR mutations. On multivariable logistic model ECC was associated with increased FVIII(p=0.009), fibrinogen(p=0.032) and D-dimers(p=0.046) (Table 2).

Table 1. Characteristics of dialysis patients positive for COVID 19 according to clotting or bleeding complications and no complications. p *<0.05, ** <0.01, ***<0.001*Total white blood cells (WBC), polymorphonuclear cells (PMN), lymphocytes (PBL), N terminal probrain natriuretic peptide (NTproBNP), international normalised ratio (INR), activated partial thromboplastin time (aPTT)*

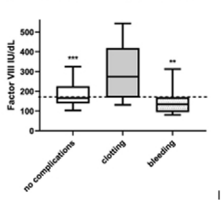
	No complications	Clotting complications	Bleeding complications
Male/Female	89/42	39/24	4/5
Age(years)	65 ±16	65 ±14	67 ±14.1
Charlson comorbidity	5 (4-7)	5 (2.5-6.5)	6.5 (4-9)
Outpatients (%)	67 (50.8)	16 (25.4)***	3 (33.3)
Mortality (%)	36 (27.3)	21 (33.3)	3 (33.3)
Haemoglobin g/L	107 ±16	99 ±19**	109 ±16.3
WBC x10^9/L	6.64 ±3.76	8.31 ±5.1**	6.4 ±3.55
PMN x10^9/L	4.91 ±3.41	6.9 ±4.99*	4.92 ±3.34
PBL x10^9/L	0.93 ±0.8	0.84 ±0.53	0.82 ±0.4
Platelets x10^9/L	174(138-229)	193(138-243)	200(155-267)
C reactive protein g/L	33(9-90)	52(18-137)	9(3-112)
Ferritin ug/L	916(482-1654)	976(627-2075)	1357(481-2340)
NTproBNP ng/L	4914(2094-27505)	13330(2535-32395)	1687(6500-32842)
Prothrombin time (sec)	12.9 ±5.1	12.3 ±2.6	11.8 ±1.7
INR	1.2 ±0.5	1.1 ±0.2	1.2 ±0.3
aPTT(sec)	37.4±9.0	36.8±9.5	37.0±8.7
Thrombin time(sec)	16(14.3-19.2)	17.7(15.3-20.6)	18.2(14.9-19.9)
Antithrombin IU/dL	89(84-103)	94(83-112)	83(75-91)
Protein C IU/dL	86(76-106)	102(80-130)	104(91-109)
Protein S IU/dL	65 (52-79)	65 (61-75)	77(75-79)
Fibrinogen g/L	5.1(3.8-6.4)	5.4(4.6-6.2)*	3.8(1.8-4.4)
D-Dimer ng/mL	1351(786-2334)	2654(1381-6019)*	885(790-1205)*
Enoxaparin mg	20(20-20)	20(20-40)	20(10-20)

Conclusions: We found that the increased risk of ECC in patients with covid-19 is not limited to CRRT but also affects intermittent HD treatments. ECC was associated with increased factor VIII, fibrinogen and D-dimer and measurement of these variables could potentially identify those at risk of ECC to start appropriate anticoagulation. Antithrombin levels were not reduced therefore appropriate anticoagulation with heparins can be used to reduce the risk of clotting in the dialysis circuit.

Table 2. Multivariable logistic model of factors independently associated with clotting of dialysis circuits in patients with covid-19. Stand error (StE). Nagelkerke r^2 0.42

variable	β	StE β	Wald	Odds ratio	95% CL	p
Log Factor VIII	3.83	1.46	6.86	46.1	2.62-91.2	0.009
fibrinogen	0.36	0.17	4.59	1.44	1.03-2.0	0.032
Log D-Dimer	1.3	0.65	3.97	3.67	1.02-13.1	0.046

Figure 1. Factor VIII concentrations in haemodialysis patients with Covid-19 with no clotting related complications, who experienced dialysis clotting and bleeding problems. ** p <0.01, *** p<0.001



No conflict of interest