OUTCOMES OF COVID-19 INFECTION IN RENAL TRANSPLANT RECIPIENTS –A SINGLE CENTRE EXPERIENCE

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ABSTRACT

Objective: The objective of this study was to analyze the outcomes of renal transplant recipients who contracted COVID-19 at institute of Kidney diseases, Peshawar.

Material and Methods: This was a case series involving 7 patients with renal transplants with good graft function, who presented to the Institute of Kidney Disease, Hayatabad, Peshawar, Pakistan with clinical features of COVID-19 from March to September 2020. Patients were evaluated for clinical features, laboratory data, radiological findings and their outcomes. Data was presented in the form of tables.

Results: Out of seven patients, 6 were males (85.71%) with a mean age of 45.71 ± 22.209 (range 20-73) years. The clinical features included, fever (all patients) and cough and dyspnea (in 5 patients). Three patients had white mild leukopenia. A combination of consolidation and ground-glass opacity was the most predominant (in 5) pattern of lung involvement on computed tomography (CT). Three out of 7 patients were admitted to Intensive care unit, where all were intubated and died of severe COVID-19 pneumonia and ARDS. The rest were treated at high dependency units that didn't need intubation, where one patient died of severe septicemia and 3 patients recovered. The mean hospital stay was 17.86 ± 5.92 days. All recovered cases had a unilateral peripheral pattern of involvement limited to only one zone on initial chest CT scan.

Conclusion: Organ transplant recipients are at high risk of developing severe Covid pneumonia and with added risk of artificial ventilation than normal population. CT imaging has an important role in predicting COVID-19 outcomes for solid organ transplant recipients.

Keywords: Covid-19, Renal Transplant Recipients.

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INTRODUCTION

The Pandemic of Corona Virus started from Wuhan, China on December 31, 2019, involving Pulmonary System and named as COVID-19 [1]. The Morbidity and mortality of COVID-19 is high among elderly & immunocompromised patients worldwide [2, 3]. Patients with renal transplantation are especially at high risk owing to immunosuppressive therapy with mainly respiratory & other manifestations [4-6] .

The Immune response to covid-19 in each patient is different due to viral load & immunological make-up [7]. At the moment only limited data is available regarding COVID-19 related to renal transplant recipients. In our study, we analyzed the outcome of covid-19 infection on renal transplant patients. This small study will help prepare the renal physicians for managing such patients.

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MATERIAL AND METHODS

This was a case series involving 7 patients with renal transplants with good graft function, who presented to the Institute of Kidney Disease, Hayatabad, Peshawar, Pakistan with clinical features of COVID-19 from March to September 2020. This facility is one of its kind in the province where facilities for conducting and managing renal transplantation are available. We studied 7 patients with functioning kidney transplant with clinical features of COVID-19 from March to September, 2020. Their clinical features, and radiological findings were noted on a proforma and presented in tables in the next section.

RESULTS

All 7 patients were found to be positive for SARS-CoV-2 nasopharyngeal sample through polymerase chain reaction. The baseline information and clinical features are presented in table-1 and 2. Six patients were males and

the most common presentation were fever and cough. Laboratory findings and radiological changes are mentioned in table 3 and 4. All patients were on triple immunosuppressive regime (Cyclosporin+ Steroid +Mycophenolate Mofetil) with a history of Induction with Basliximab.

The laboratory tests of all seven patients were analyzed (see Table 3) with mean base line Creatinine at presentation was 2.01 mg/dl. (See table 4). Most of the patients had a normal white blood cell count, while 42.85% (03/07) had leukopenia.

The radiological evidence of Pneumonia was found in all 7 patients with CT showing a combination of consolidation and ground glass opacity was the most predominant (71.4%, n= 5) pattern of lung involvement (see Table 5). All recovered cases had a unilateral peripheral pattern of involvement limited to only one zone on initial chest CT. Three patients were admitted in ICU, who were intubated and died of severe COVID-19 pneumonia and ARDS. Four were treated at high dependency units who didn't need intubation. Amongst these, one patient died of severe septicemia after 3 weeks of stay, and 3 patients recovered and were discharged home. The mean hospital stay was 17.86 ± 5.92 days with longer stay in ICU. A multidisciplinary approach including Nephrologist, Urologist, Pulmonologist and Intensivists were applied to treat all these patients. The immunosuppressive therapy was reduced and MMF was stopped completely in severe ill patients with increase dose of IV steroids and Broad spectrum IV antibiotics. There outcome is given in table 6.

Table 1: Gender and Age-wise Distribution

Gender			
	Frequency	Percent	Mean Age ± Std. Deviation
Male	6	85.7	45.71 ± 22.209
Female	1	14.3	
Total	7	100.0	

DISCUSSION

The renal transplant patients, especially elderly, are at more risk of COVID-19 infections and its morbidity and mortality due to the use of intense immunosuppressive therapy. Limited studies are available regarding renal transplant outcomes in COVID-19 infections till date especially in our country. The optimal management of SARS-CoV-2 has not yet been established especially in solid organ transplant recipients, where adjustments to immunosuppressive medications must be considered while balancing the potential for acute rejection and coinfection with bacterial or opportunistic pathogens [7]. A case

Table 2: Clinical presentation

No.	Patients	Cough n (%)	Fever n (%)	Sore Throat n (%)	Myalgia n (%)	Gastro-intestinal Symptoms n (%)	Dyspnea
1	Male	+	+	-	+	-	+
2	Male	+	+	+	-	-	-
3	Female	-	+	+	+	+	+
4	Male	+	+	-	-	-	+
5	Male	-	+	+	+	+	-
6	Male	+	+	-	+	+	+
7	Male	+	+	-	-	-	+
Total		5 (71.4)	7 (100)	3 (42.9)	4 (57.1)	3 (42.9)	5 (71.4)

Table 3: Laboratory Data of Each Case

No.	Patients	Hemoglobin	Total leucocyte count	Neutrophil	Lymphocytes	Platelets	C-Reactive proteins	Alanine Transaminase (ALT)	INR	Blood urea	Serum Creatinine
1	Male	11.5	5400	4276	920	150	33	43	1	62	2.3
2	Male	12.3	8800	7653	1244	320	2	22	1	45	1.0
3	Female	10.8	3800	3265	533	60	120	172	1.4	56	1.9
4	Male	13.6	7200	5993	1105	255	3	40	1	38	1.1
5	Male	12.7	7600	7453	1041	180	7	35	1	40	1.2
6	Male	11.9	3958	3232	720	54	75	48	1.2	91	2.2
7	Male	13.4	2500	2088	510	43	83	123	2.2	110	4.4

Table 4: Descriptive Statistics

Descriptive Statistics					
	n	Minimum	Maximum	Mean	Std. Deviation
Duration after Transplant	7	2	16	7.43	4.962
Hemoglobin	7	10.8	13.6	12.314	1.0090
Neutrophils	7	2088.0	7653.0	4851.429	2199.5121
TLC	7	2500.0	8800.0	5751.143	2490.8584
Lymphocytes	7	510.0	1244.0	867.571	286.4931
Platelets	7	43.0	320.0	151.714	107.6796
CRP	7	2.0	120.0	46.143	46.8346
ALT	7	22.0	172.0	69.000	56.0476
INR	7	1.0	2.2	1.257	.4429
Urea	7	38.0	110.0	63.143	27.4495
Creatinine	7	1.0	4.4	2.014	1.1796

Table 5: Radiological findings of Covid patients

Radiological Data		
Findings on CT	Frequency	Percentage
Unilateral Consolidation one zone	2	28.6
Consolidation and GGOs	5	71.4
Total	7	100.0

Table 6: Demographic Features and outcome

No.	Patients	Age (Years)	Duration of Renal Transplant	Co-Morbidity	Outcome
1	Male	65	16 years	Hypertension	Death
2	Male	20	2 years	None	Discharged
3	Female	30	4 years	Diabetes mellitus, Hypertension & Obesity	Death
4	Male	22	3 years	Hypertension	Discharged
5	Male	45	8 Years	Hypertension	Discharged
6	Male	73	11 Years	Hypertension, Diabetes Mellitus & Coronary Artery Disease	Death
7	Male	65	8 years	Hypertension & Coronary Artery Disease	Death

report of 2 cases revealed good outcome in renal transplant recipients suffering from Covid 19, who were treated with reduction in immunosuppressive dosages, along with supportive care. Both patients survived [8]. Many studies have reported a similar incidence of complications related to Covid with normal population with debilitating illnesses [9]. A similar study was presented in the journal of Kidney international recently included the data of 7 patients with similar results [10].

Although, this is a small data which is limited to a single center, and for a limited time, further observational studies of this kind are needed to explore the outcome of Covid 19

CONCLUSION

In Conclusions, in renal transplant patients, high suspicion screening should be done regarding COVID-19 clinical features especially elderly patients. The laboratory findings of Leucopoenia with lymphopenia and Radiological evidence of COVID-19 pneumonia are diagnostic and prompt treatment with multidisciplinary approach should be adopted to save the lives.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Munib S: Study design, discussion, manuscript writing.

Ahmed T: Concept, Critical review.

Ahmed R: Analysis and interpretation.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.