Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

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SUPPLEMENTAL FILE OF CONTENTS

COVID-19 PCR TESTING

Clinical specimens for Covid-19 diagnostic testing were obtained in accordance with Centers for Disease Control and Prevention (CDC) guidelines. Nasopharyngeal and/or oropharyngeal swabs were collected in 3mL viral transport media and RNA extraction followed by real-time RT PCR was performed using one of three commercial methods. These include the Luminex ARIES, Abbott m2000 or the Hologic Panther Fusion SARS-COV-2 assays. All testing was performed in accordance with the manufacturer's instructions. Each assay is designed to amplify two separate regions within the SARS-COV-2 viral genome (Luminex: ORF1a/N, Abbott: RdRp/N and Hologic: separate ORF1a regions).

CD3/CD4/CD8 T CELL SUBSETS

Immunophenotyping for T cell subsets was performed using the AQUIOS CL Flow Cytometer (Beckman Coulter) with the AQUIOUS Tetra-1 Panel test (Beckman Coulter). Peripheral whole blood was stained and incubated with a four-color monoclonal antibody cocktail consisting of CD45-FITC/CD4-RD1/CD8-ECD/CD3-PC5. After lysis of red cells, total lymphocyte count and CD3, CD4 and CD8 counts and percentages were determined using the AQUIOS CL Flow Cytometer (Beckman Coulter).

FLOW CYTOMETRY CYTOKINE QUANTIFICATION

Patient's blood was drawn into plasma preparation tubes (PPT) and centrifuged at 1100 x g for 10 minutes. For each patient sample, 12.5 uL of plasma was added to duplicate wells of a 96-well plate, and cytokine quantification was performed with bead-based cytokine antibodies (Biolegend, San Diego CA). Briefly, following capture bead incubation for 2 hours, primary biotinylated detection antibodies were added and incubated for 1 hour. Streptavidin-PE was then added and incubated for 30 minutes. All reactions were performed in duplicates, and standard curves for each cytokine were run at the same time using the same instrument settings as patient samples. Analysis was performed with a 3-laser CytoFLEX flow cytometer (Beckman Coulter, Miami, FL). Cytokine quantification was performed using the individual cytokine standard curves. Duplicate samples were averaged for the final concentration.

TREATMENT OF COVID POSITIVE PATIENTS

Patients without chest x-ray findings of pneumonia and stable oxygenation were monitored after decreasing mycophenolate mofetil (MMF)/mycophenolic acid (MPA) doses by 50% and maintaining 12-hour tacrolimus trough levels between 3-6 ng/ml. MMF/MPA was held and patients were started on hydroxychloroquine with a loading dose of 400 mg PO q12H for one day followed by 400 mg daily for four days if the QT interval remained normal. All patients with pneumonia were started on IV ceftriaxone 1 g daily and either doxycycline 100mg bid or azithromycin 500 mg on the first day followed by 250 mg daily to cover for typical and atypical bacteria because transplant patients are at higher risk for secondary infections. Prednisone dose were kept at 5 mg daily. Tacrolimus was held in patients who required intubation and

some of those patients received compassionate use leronlimab (PRO 140, CytoDyn, Inc.) or toculizumab. Leronlimab 700mg is administered subcutaneously weekly for up to 4 weeks. Toculizumab was given at 600 mg IV over one-hour infusion. Apixaban was given to patients with D-dimer levels > 3.0 ug/ml.

DETAILED PRESENTATION OF TWO CASES DECEASED AT HOME

Of the 8 patients without significant respiratory symptoms who were closely monitored at home, 2 were found deceased in bed while self-quarantined from other family members. The first patient was a 60-year-old Jamaican male who had end-stage renal disease due to membranous nephropathy, previously on hemodialysis for 3 years, who had received a deceased-donor transplant 5 weeks prior with anti-thymocyte globulin induction. The patient contacted the transplant center with complaints of diarrhea but denied fevers, chills, cough, sore throat, or dyspnea. After a positive Covid-19 test, he was advised to hold MPA and to call the transplant center with any respiratory symptoms and a follow-up appointment at transplant center was scheduled in a week. Unfortunately, his wife found him deceased in his room. The second patient was a 72-year-old African American female with diabetic nephropathy and hypertension, who received a preemptive deceased-donor transplant 2 months prior with basiliximab induction. She was treated with anti-thymocyte globulin 1.5 mg/kg for 4 doses for grade IIA acute T-cell mediated rejection a month ago. Her creatinine gradually improved to 1.5 mg/dl. She complained of rhinorrhea during a routine visit and tested positive for Covid-19. She did not have dyspnea and pulse oximeter reading in the clinic revealed oxygen saturation of 99%. Her immunosuppression was decreased, and she was monitored closely at home, with instructions to contact the transplant center with any

respiratory symptoms. One week later the patient was found unresponsive at home and did not respond to resuscitation by EMT.

SUPPLEMENTAL TABLE 1: CLINICAL CHARACTERISTICS OF THE PATIENTS AT BASELINE

	Patient Number (%) n= 36
Sex, male, n %	26 (72)
Age in years, median [range]	60 [32-77]
Race, African-American, %	14 (39)
Ethnicity, Hispanic %	15 (42)
Type of renal transplant, deceased donor, %	27 (75)
Anti-thymocyte globulin induction, %	15 (42)
Maintenance immunosuppression, %	
Tacrolimus	34 (97)
Mycophenolate 2g/day	11 (31)
Mycophenolate 1 g/day	16 (44)
Mycophenolate < 1 g/day	4 (11)
Prednisone	34 (94)
Causes of renal disease, %	
Diabetic nephropathy	19 (53)
Glomerulonephritis	8 (22)
Hypertensive nephroangiosclerosis	5 (14)
Others	3 (8)
Comorbidities, %	
Hypertension	34 (94)
Diabetes mellitus	25 (69)
Heart disease	6 (17)
Lung disease	4 (11)
Cancer	2 (6)
Smoking history, %	13 (36)
Influenza vaccination, %	21 (58)
Body mass index (median [range]) kg/m2	29.3 [21.2-43.6]
Use of Angiotensin-II Receptor Blocker, %	8 (22)
Baseline Creatinine (median [range]) mg/dL	1.4 [0.8-6.3]

SUPPLEMENTAL TABLE 2: CYTOKINE PROFILES OF 5 PATIENTS TREATED WITH LERONLIMAB (BEFORE AND 3 DAYS AFTER ADMINISTRATION).

	Patient 1		**Patient 2**		**Patient 3**		**Patient 4**		**Patient 5**	
Cytokines (pg/mL)	*Day 0*	*Day 3*	*Day 0*	*Day 3*	*Day 0*	*Day 3*	*Day 0*	*Day 3*	*Day 0*	*Day 3*
IL-2	<0.9	<0.9	<0.3	<0.3	0.5	<.3	<0.3	0.4	<0.3	0.4
IL-4	<4.8	<4.8	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
IL-5	<3.4	<3.4	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
IL-6	1000.1	344.2	522.6	122.1	2506.6	214.1	8175.1	2021.5	83	36.8
IL-9	<2.2	<2.2	1.8	1	1.8	1.9	33.2	58.3	1.9	2.3
IL-10	<1.9	7.7	3	2.7	<0.9	1.4	<0.9	1.3	1.3	4.9
IL-13	<7.6	<7.6	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	1.1	<1.0
IL-17A	<0.5	<0.5	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
IL-17F	<2.1	<2.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
IL-21	<19.8	<19.8	6.1	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5
IL-22	<0.8	10.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
IFN-γ	<5.8	6.9	<1.7	<1.7	<1.7	<1.7	3.6	<1.7	<1.7	<1.7
TNF-α	8.48	<8.2	1.4	1.2	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7