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Authors

Yang, Bryant
Fulcher, Jennifer A
Ahn, Jenny
et al.

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Clinical Characteristics and Outcomes of COVID-19 Patients Receiving Compassionate Use Leronlimab

Bryant Yang M.D.[1], Jennifer A. Fulcher M.D. [1,2], Jenny Ahn R.N.[3], Marlene Berro M.S.[3], David Goodman-Meza M.D.[1], Kush Dhody M.B.B.S.[4], Jonah B. Sacha Ph.D.[5],Arash Naeim M.D.[3], Otto O. Yang M.D.[1,6]

[1]Division of Infectious Diseases, Department of Medicine, David Geffen School of Medicine at the University of California Los Angeles, Los Angeles, CA 90095
[2]VA Greater Los Angeles Healthcare System, Los Angeles, CA 90073
[3]Clinical and Translational Science Institute Office of Clinical Research, Department of Medicine, David Geffen School of Medicine at the University of California Los Angeles, Los Angeles, CA 90095
[4]Amarex Clinical Research, LLC, Germantown, MD 20874
[5]Vaccine and Gene Therapy Institute and Oregon National Primate Research Center, Oregon Health & Science University, Beaverton, OR 97006
[6]Department of Microbiology, Immunology, and Molecular Genetics, David Geffen School of Medicine at the University of California Los Angeles, Los Angeles, CA 90095

Corresponding author:
Otto O. Yang M.D.
BSRB 173, 615 Charles E Young Drive South, Los Angeles, CA 90095
Phone: 310-794-9491 Facsimile: 310-983-1067 Email: oyang@mednet.ucla.edu

Summary: Leronlimab is a humanized monoclonal antibody antagonist of CCR5. We describe our experience treating 23 COVID-19 patients via open label compassionate use. Given the severity of disease in these patients, the overall encouraging outcomes suggest a potential benefit.

ABSTRACT

Background: Leronlimab, a monoclonal antibody blocker of CCR5 originally developed to treat HIV-1 infection, was administered as an open label compassionate use therapeutic for COVID-19.

Methods: 23 hospitalized severe/critical COVID-19 patients received 700mg leronlimab subcutaneously, repeated after seven days in 17/23 patients still hospitalized. 18/23 received other experimental treatments, including convalescent plasma, hydroxychloroquine, steroids, and/or tocilizumab. 5/23 received leronlimab after blinded placebo-controlled trials of remdesivir, sarilumab, selinexor, or tocilizumab. Outcomes and results were extracted from medical records.

Results: Mean age was 69.5±14.9 years. 20/23 had significant co-morbidities. At baseline, 22/23 were receiving supplemental oxygen (3/23 high flow, 7/23 mechanical ventilation). Blood showed markedly elevated inflammatory markers (ferritin, D-dimer, C-reactive protein) and elevated neutrophil:lymphocyte ratio. By day 30 after initial dosing, 17/23 were recovered, 2/23 were still hospitalized, and 4/23 had died. Of the 7 intubated at baseline, 4/7 were fully recovered off oxygen, 2/7 were still hospitalized, and 1/7 had died.

Conclusions: Leronlimab appeared safe and well tolerated. The high recovery rate suggested benefit, and those with lower inflammatory markers had better outcomes. Some but not all patients appeared to have dramatic clinical responses, indicating that unknown factors may determine responsiveness to leronlimab. Routine inflammatory and cell prognostic markers did not markedly change immediately after treatment, although IL-6 tended to fall. In some persons C-reactive protein clearly dropped only after the second leronlimab dose, suggesting that a higher loading dose might be more effective. Future controlled trials will be informative.

Key Words: SARS-CoV-2; COVID-19; leronlimab; immunomodulatory therapy

INTRODUCTION

Late in 2019, the novel coronavirus severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was identified as the cause of an outbreak of a pneumonia syndrome (eventually termed coronavirus disease 2019, COVID-19) in Wuhan, China. Rapid spread of the virus across the globe was declared a pandemic by March 11, and has been responsible for almost 8.3 million infections and 450,000 deaths as of June 17, 2020 [1]. To date the only drug treatments with established benefit have been the polymerase inhibitor remdesivir, which has a modest impact on recovery time but no definite improvement in mortality [2], and dexamethasone, which may modestly reduce mortality in patients requiring supplemental oxygen or mechanical ventilation [3]. Therefore there has been a keen interest in developing treatments to reduce the mortality of COVID-19. Because the pathogenesis of fatal COVID-19 involves both viral infection and a hyperinflammatory state causing end organ damage through a cytokine storm-like syndrome, therapeutic development has focused on both direct antiviral agents (such as remdesivir) and immunomodulatory agents.

Leronlimab is a humanized monoclonal antibody that binds CC-chemokine receptor-5 (CCR5), and has undergone extensive clinical testing for the treatment of Human Immunodeficiency Virus type 1 (HIV-1) infection [4-7]. It acts as a competitive inhibitor by binding the N-terminus and second extracellular loop and blocking CCR5-mediated HIV-1 infection of cells. CCR5 is expressed predominantly on T cells, but also found on macrophages, dendritic cells, and eosinophils, to mediate chemotaxis in response to its cognate ligands that include CCL5 (RANTES), CCL3 (MIP-1α), and CCL4 (MIP-1β). These ligands are integral in the recruitment of these immune cells to inflammatory sites. Binding of leronlimab to CCR5 on cells not only blocks HIV-1 entry, but also prevents CCL5-mediated

calcium flux with an IC_{50} of about 45 µg/mL [8] and is therefore a potent inhibitor of CCR5-mediated chemotaxis.

The immunopathogenesis of COVID-19 likely involves the excessive influx of immune cells into the lung. The original SARS caused by the closely related virus SARS-CoV-1 has very similar clinical findings to COVID-19 [9, 10], and that virus elicits high levels of CCL5 expression by airway epithelial cells and macrophages [11, 12]. In SARS-CoV-2 infection, activated macrophages in the airways express high levels of CCL3, with the highest expression seen in patients with critical COVID-19 [13]. Thus it is likely that CCR5-mediated chemotaxis similarly contributes to the excessive lung inflammation seen in COVID-19, and leronlimab has been proposed as an immunomodulatory treatment and tested in a few patients with anecdotal success [14, 15]. Here we report the outcomes of the 23 COVID-19 patients who received open label compassionate use leronlimab at our medical center in April of 2020, the largest reported series to date.

METHODS

Study participants. Leronlimab was given on an open label compassionate-use basis to patients hospitalized with PCR-confirmed SARS-CoV-2 infection at two hospitals of the University of California at Los Angeles (UCLA) academic medical center in April of 2020. Each participant or his/her legally authorized representative (LAR) provided written informed consent prior to treatment. The protocol was reviewed and approved by the UCLA Institutional Review Board and each leronlimab treatment was given under an individual emergency investigational new drug (EIND) approval through the Food and Drug Administration. Infectious disease physicians evaluating COVID-19 patients referred them for potential leronlimab therapy when other experimental therapeutic options were

contraindicated or exhausted. Patients were excluded if they were under 18 years of age, pregnant or breastfeeding, or unable to provide informed consent directly or through a LAR.

Leronlimab administration. Leronlimab 700mg was administered via two abdominal subcutaneous injections of 350mg each, with repeat dosing if they remained hospitalized after 7 days. All treatment decisions and laboratory monitoring were left to the discretion of the physicians caring for the patients.

Clinical data collection. Laboratory testing values, adverse events, and oxygen requirements were collected via manual chart review and electronic health records extraction, supported through an IRB-approved institutional Clinical Research COVID Registry. Fraction of inspired oxygen on patients not receiving mechanical ventilation was estimated [16]. All patients were followed-up at least 30 days after the first administration of leronlimab. A positive clinical response for the purposes of this study was defined as survival without further need for acute hospital care at 30 days of follow-up.

Statistical analyses. Laboratory data were compared using non-parametric Mann-Whitney tests. All graphs and statistical analyses were performed using GraphPad Prism v8.4.2.

Role of the funding source. The funder had no role in the study design, data collection, analysis of data, interpretation of data, writing of the report, or decision to submit the manuscript for publication.

RESULTS

Demographics of patients who received compassionate use open label leronlimab. Twenty-three patients received leronlimab on an open label compassionate-use basis (Table 1, Supplementary Table S1). Reflecting our regional demographics of COVID-19 cases, these individuals were older than typical patients seen for infectious disease consultation at our

institution (mean 69.5, s.d. 14.9 years), had a slight male predominance (43% female versus 57% male), were racially and ethnically diverse (70% white, 17% Asian, and 9% other, with 35% Latinx), and had frequent medical co-morbidities (20/23 with significant underlying active chronic medical conditions). Few patients were underweight (2/23 with BMI<18.5), overweight (2/23 with BMI 25.0 to 29.9), or obese (3/23 with BMI >29.9). Co-morbidities were wide-ranging, most commonly hypertension (13/23), chronic kidney disease (8/23), and type 2 diabetes mellitus (5/23), Others included organ transplantation (heart=2/23, liver=2/23, kidney=1/23), malignancy (breast=1/23, lymphoma=1/23), vascular disease (heart=1/23, carotid=1/23), COPD (2/23), pulmonary fibrosis (1/23), and rheumatologic/immunologic disorders (Sweet Syndrome=1/23, rheumatoid arthritis 1/23). Overall this was a high risk cohort with significant co-morbidities.

Baseline clinical characteristics of individuals and treatment with leronlimab. The patients were admitted to the hospital an average of 5.6 days after their onset of symptoms (range 0 to 18, s.d. 4.8 days). As summarized in Table 1, the first dose of leronlimab was administered an average of 9.7 days after symptoms onset (range 1 to 25, s.d. 6.5 days). At time of dosing, 22 of 23 individuals were receiving supplemental oxygen, including 3 on high flow oxygen and 7 on mechanical ventilation, and 5 of 23 required vasopressor support. Laboratory blood markers of disease (Figure 1) exhibited moderately increased lactate dehydrogenase (LDH, mean 366 ± 142 U/L) but markedly elevated inflammatory markers including ferritin (mean 2235 ± 2332 µg/L), D-dimer (mean 3018 ± 2850 mg/L), and C-reactive protein (CRP mean 9.2 ± 7.9 mg/L). Examination of blood leukocytes indicated relatively normal neutrophil counts (mean 4882 ± 2637/µl, with 4/23 values above the normal upper limit of 6900/µl), depressed total lymphocyte counts (mean 1049 ± 592/µl, with 15/23 values below the normal lower limit of 1300/µl), and thus elevated neutrophil:lymphocyte ratios (mean 6.3 ± 5.6, with

21/23 >2, and 18/23 >3). Monocyte counts were relatively normal (mean 515 ± 227/µl, with 0/23 below the lower limit of 200/µl and 2/23 above the upper limit of 800/µl). Overall, these clinical and laboratory parameters reflected a relatively severely ill cohort of COVID-19 patients by both inflammatory markers and clinical status.

Safety of leronlimab, and concurrent treatments given for COVID-19. Leronlimab was well tolerated with no noted adverse events with the exception of one person (participant F) who developed a moderate maculopapular skin rash that was likely due to concurrent cephalosporin administration. 17 of 23 patients received two doses a week apart. Of the six who received only one dose, the second dose was not given to three due to hospital discharge before the second dose, one due to skin rash, and two due to death. In addition to leronlimab, 18/23 patients received other experimental treatments for COVID-19 (Table 1, supplementary Table S1, supplementary Figure S2). Co-administered treatments included convalescent plasma (10/23), hydroxychloroquine (5/23), treatment dose steroids (4/23), and open label tocilizumab (2/23). Five persons received leronlimab after progressing in blinded placebo-controlled trials of remdesivir (2/23), sarilumab (1/23), selinexor (1/23), or tocilizumab (1/23).

Clinical outcomes after leronlimab treatment. The status of participants was assessed at 30 days after the first dose of leronlimab (Supplementary Table S1). Defining recovery as survival and no longer being hospitalized, overall 17 of 23 (74%) were recovered, of which one still required supplemental oxygen (1 liter per minute). Two of 23 (9%) were still alive but remained hospitalized, and four of 23 (17%) had died. Examining just the subset of seven patients who were intubated at the time of leronlimab treatment initiation, four of seven (57%) were recovered and required no supplemental oxygen, while two of seven (29%) were

still alive but remained hospitalized, and one of seven (14%) had died. The two initially intubated patients who were still hospitalized on day 30 both eventually stabilized and were discharged from the hospital breathing spontaneously.

Markers associated with recovery after leronlimab treatment. Among demographic and clinical factors, there were statistically insignificant trends for younger age (Figure 1A) and lower oxygen (Figure 1B) requirement, and no significance differences in BMI (Figure 1C) or LDH level (Figure 1D) at baseline between those who had recovered by 30 days versus those who had not recovered. For inflammatory markers, baseline D-dimer (Figure 1E) and CRP (Figure 1F) were significantly higher in those who did not recover ($p=0.007$ and $p=0.02$ respectively), and ferritin was insignificantly higher (Figure 1G). Of blood leukocytes, neutrophil (Figure 1H) and lymphocyte (Figure 1I) counts were insignificantly higher and lower respectively in those who did not recover, but the ratio of neutrophils to lymphocytes (Figure 1J) was significantly higher ($p=0.006$). Monocytes were insignificantly lower in those who did not recover (Figure 1K). Most participants did not have serial plasma interleukin-6 (IL-6) measurements, but most of those who did exhibited reductions IL-6 temporally correlated to leronlimab administration, although several had confounding treatments (Supplementary Figure S1). Overall, these findings were consistent with previous reports of predictors of risk in COVID-19.

Changes in inflammatory and cell markers after leronlimab treatment. Examination of disease markers in the 10 days after treatment with leronlimab suggested some differences between those who recovered versus those who did not. D-dimer levels in both subsets remained relatively stable during dosing, remaining moderately elevated in recovered persons and markedly elevated in unrecovered persons (Figure 2A). CRP in the recovered group remained

relatively stable, perhaps dropping after the second dose, while in the unrecovered group seemed to remain persistently elevated perhaps with a slight decrease after the second dose (Figure 2B). Ferritin decreased in the unrecovered persons and increased slightly in the recovered group, converging at a similar level by 10 days in both groups (Figure 2C). Absolute lymphocyte counts overall appeared unchanged in both groups but persistently lower in the unrecovered group (Figure 2D). Absolute neutrophil and monocyte counts were similarly unchanged, but persistently distinct between the recovered and unrecovered groups (Figures 2E and 2F). The neutrophil:lymphocyte ratio was unchanged in those who did recover, and was elevated but appeared to decrease with each leronlimab dose in those who did not recover (Figure 2G). While these were the general patterns noted, a confounder was the dropout of patients from these analyses (Figure 2H), due to early hospital discharge in the recovered group and death in the unrecovered group. Finally, only a few patients had plasma interleukin-6 (IL-6) levels monitored serially (Supplementary Figure S1); most of these exhibited acute reductions in IL-6.

The inflammatory marker CRP in some individuals appeared not to drop until the second dose of leronlimab. While across groups leronlimab treatment did not demonstrate marked effects on disease markers in the 10 day time span following the first dose (Figure 2A-H), in several persons the marker CRP appeared to show no decrease after the first dose but a dramatic drop after the second dose of leronlimab (Figure 2I). While many individuals had confounding treatments, these specific examples suggested a temporal relationship of CRP reduction associated with the second dose.

DISCUSSION

This series is the largest reported cohort of leronlimab-treated COVID-19 patients to date. Given that leronlimab has shown a highly favorable safety profile in over 800 patients treated in FDA approval trials for the treatment of HIV-1 infection [4-7], we administered it to several individuals on an open label compassionate use basis, when therapeutic and clinical trials options were relatively limited. Leronlimab appeared well tolerated and safe in our population, with only one possible adverse event being a maculopapular rash that was attributable to concurrent use of a cephalosporin antibiotic.

Limited anecdotal evidence from two small studies has suggested that leronlimab may improve outcomes in COVID-19 infection. Patterson *et al* examined outcomes in ten "terminally ill" patients [14] of whom seven were on mechanical ventilation, one was on high flow oxygen, and two were on low flow oxygen. Six of ten survived 14 days after treatment with leronlimab, with two able to be successfully removed from mechanical ventilation. Similar to our study, there were no clear changes in general clinical markers (or several cytokines not monitored in our study) with the exception of a consistent drop in interleukin-6 (IL-6) in most persons. Akalin *et al* reported a small series of renal transplantation patients with COVID-19 of whom six received leronlimab [15], and also observed a rapid drop in IL-6. Both studies also found changes in T cells, with normalization of $CD4^+$ and $CD8^+$ subsets amounts and ratios (particularly an increase in the $CD8^+$ T cell subset).

Interestingly, our data suggested that the current leronlimab dosing regimen may be suboptimal, since several patients exhibited rapid drops in the inflammatory marker CRP only after the second dose. Given its estimated half- life of about ten days, the second dose

after seven days should achieve a higher peak than the first dose, and the maximal effect would not be achieved until after the second dose. This is consistent with the receptor occupancy data presented by Patterson *et al* [14], showing maximal effect after the second dose of the same regimen. Also, our data do not appear to demonstrate a relationship between outcome after leronlimab to the duration of disease at the time of dosing (Supplementary Table S1).

Because this was not a controlled trial, the impact of leronlimab is not directly ascertainable. However, the data provide anecdotal evidence for a benefit from treatment. Most of our patients had significant risk factors for severe disease, including age over 60 and co-morbidities associated with poor outcome [17, 18]. Of the 23, seven required mechanical ventilation at the time of leronlimab dosing. Of these critically ill patients, six of seven were alive after >70 days, a substantially higher survival rate than other reports of critically ill COVID-19 patients [19-22], which range from 42% to 61% in cohorts followed about 30 days after hospitalization. Of the 15 with milder (but still "severe" as defined by supplemental oxygen requirement) illness, 13 no longer required further acute hospital care by 30 days. Thus, the overall outcomes for this high-risk group of patients was better than historically observed in multiple reports from the same time frame.

It was also notable that clinical responsiveness to treatment was highly variable; some patients appeared to have a rapid dramatic response to treatment (e.g. participants A and F who were rapidly extubated after being on ventilators, or participants B, C, and D who were weaned off supplemental oxygen and discharged home within three days), while others seemed to have less effect. Mechanistic studies may uncover determinants and markers for

leronlimab responsiveness, such as CCR5 occupancy [14], and controlled trials will be required to assess the benefit of treatment.

Most of these patients did receive additional possibly confounding treatments for COVID-19. Although several received hydroxychloroquine (including Participant V who had been chronically for rheumatoid arthritis), the effect of this treatment was unlikely to be significant, given the results of randomized controlled trials demonstrating no benefit [23, 24]. Interleukin-6 receptor blocking antibodies were given to two participants as open label treatments, and two others were in placebo-controlled trials of these agents. A recent press release regarding a controlled trial (EMPACTA) suggested that tocilizumab may modestly reduce mortality (from 19% to 12%) in severely ill patients [25] and a trial of sarilumab was halted for futility [26]; thus the influence of these agents should be minimal in our cohort. While remdesivir has been shown to be helpful particularly in persons requiring no more than low flow oxygen supplementation [2], only one participant (on a ventilator) received this treatment. Several participants received convalescent plasma, but this intervention appears to have only a small effect on 30 day mortality particularly when given within three days of diagnosis [27]; our participants mostly received plasma much later, so it would seem unlikely that plasma was a significant contributor to our survival rate 30 days after leronlimab. Finally, three participants received high dose steroids, the intervention shown to have the greatest impact on survival [3]. However, the reported survival benefit of steroids is greatest for intubated patients (29% versus 41% mortality) and minimal for patients requiring only non-invasive oxygen supplementation (22% versus 25%), and only one of our participants who received steroids was intubated. Thus it is unlikely that steroids and other interventions aimed at treating COVID-19 markedly affected survival in our cohort overall.

The prognostic value of some biomarkers was confirmed in our cohort, and these markers also reflected the severity of disease in our participants. In particular, higher C-reactive protein [17] and D-dimer [18, 28] blood levels predicted worse outcome in agreement with prior analyses of COVID-19 in general. Also highly significant was an increased ratio of blood neutrophils to lymphocytes, another previously reported marker of disease severity [29, 30]. The increased ratio appeared to be a combination of increased neutrophils and decreased lymphocytes, with low lymphocytes being a previously reported poor prognostic factor [17, 31], although neither was statistically significant individually, perhaps due to limited sample size. Similarly, a trend for higher ferritin [32] in those who didn't meet recovery criteria was present but not statistically significant. As opposed to prior suggestions that blood monocyte elevation is a prognostic indicator of poor outcome [33, 34], our recovered patients had slightly higher (but not statistically significant) monocyte levels than those who did not recover. Baseline LDH, also a previously reported factor [17, 31], was also not significantly associated with outcome in our cohort. Some of these discrepancies were likely due to our limited sample size. Too few patients had serial measurements of interleukin-6 [32, 35] to assess this marker reliably. The relationship of inflammatory markers to response to leronlimab treatment is unclear. It is possible that persons with less inflammation had better outcomes after leronlimab treatment simply because they were less ill at baseline. Alternatively, it can be hypothesized that leronlimab could be more effective earlier in the inflammatory response by preventing chemotaxis of immune cells to effector sites such as the lung, and less effective later because those sites are already maximally infiltrated with those cells.

Overall, our findings suggest a benefit to leronlimab in the treatment of severe COVID-19, including persons requiring mechanical ventilation. Some routine clinical markers of disease severity (blood CRP, D-dimer, and neutrophil:lymphocyte ratio) were associated with outcome after leronlimab treatment while others were not (ferritin, lymphocyte count, monocyte count, LDH). Whether this is due to our small cohort size or differences between leronlimab treated versus untreated patients is unclear. Randomized placebo-controlled trials are now underway and should help provide more helpful data to clarify efficacy and predictors of response to leronlimab to treat COVID-19.

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CONFLICT OF INTEREST

J.B.S. is a paid consultant for CytoDyn Inc. O.O.Y. is on the executive board of directors of Applied Medical Inc and holds stock ownership. O.O.Y. is a founder and holds stock ownership in CDR3 Therapeutics Inc. A.N. is a founder and holds stock ownership in InVista Health Inc. K.D. is employed by Amarex Clinical Research, which is contracted by CytoDyn to manage the clinical development of leronlimab for the treatment of COVID-19. D.G.M. reports research grants from Gilead, outside the submitted work. The other authors declare no competing interests.

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TABLE

Demographics	
Age	68.5 ± 14.9
Sex	
Male	13 (57%)
Female	10 (43%)
Race	
Asian	4 (17%)
Black	0 (0%)
White	16 (70%)
Other	2 (9%)
Unknown	1 (4%)
Latinx Status	
Latinx	8 (35%)
Not Latinx	14 (61%)
Unknown	1 (4%)
BMI	24.7 ± 5.6
Comorbidities	
Chronic cardiac disease (non-HTN)	7 (30%)
Chronic pulmonary disease (COPD, asthma)	3 (13%)
Hypertension	13 (57%)
CKD	7 (30%)
Chronic Liver disease	0 (0%)
Cancer	2 (9%)
HIV	0 (0%)
Obesity (BMI>30)	4 (17%)
Diabetes	7 (30%)
Organ transplant	5 (22%)
Any other form of immunosuppression	6 (26%)
Obesity (BMI>30)	3 (13%)
Chronic Oxygen Requirement	0 (0%)
None	3 (13%)
Baseline Characteristics/Laboratories at Time of First Leronlimab Dose	
Days of symptoms	9.7 ± 6.5
Vasopressor support	5 (22%)
Low flow supplemental oxygen	12 (52%)
High flow supplemental oxygen	3 (13%)
Mechanical ventilation	7 (30%)
WBC (10^3 cells/µL)	6.74 ± 3.10
ANC (10^3 cells/µL)	4.88 ± 2.67
ALC (10^3 cells/µL)	1.05 ± 0.59
Neutrophil:Lymphocyte Ratio	6.34 ± 5.60
LDH U/L	366 ± 142
Ferritin µg/L	2235 ± 2332
D-Dimer mg/L	3018 ± 2850
CRP mg/L	9.2 ± 7.9
Other COVID Therapies	

HCQ (open label)	7 (30%)
Tocilizumab (open label)	2 (9%)
Sarilumab clinical trial (placebo-controlled)	1 (4%)
Selinexor clinical trial (placebo-controlled)	1 (4%)
High dose steroids	3 (13%)
Remdesivir*	1 (4%)
Convalescent plasma (open label)	10 (43%)
Outcomes (Day 30)	
Recovered, No Supplemental Oxygen Required	16 (70%)
Recovered, Low Flow Oxygen Required	1 (4%)
Still Hospitalized	2 (9%)
Died	4 (17%)

*Two persons were enrolled in a randomized controlled trial of remdesivir; unblinding revealed that one received remdesivir and one received placebo.

FIGURE LEGENDS

Figure 1. Differences in blood inflammatory markers at baseline between recovered and not recovered patients. Baseline clinical characteristics, laboratory values and blood counts were compared between patients treated with leronlimab who recovered (n=17) and those that did not (n=6). Patients requiring mechanical ventilation are indicated by circles and those who did not are indicated by triangles. Medians for all recovered and non-recovered persons are indicated by horizontal bars. Differences between the groups were assessed using Mann-Whitney test and p-values shown.

Figure 2. Changes in blood inflammatory markers during the course of leronlimab therapy for COVID-19. (A-G) Clinical laboratory test values and blood counts are plotted over time with the x-axis showing days since leronlimab treatment in recovered versus non-recovered participants. Dotted lines indicate timing of leronlimab doses. The lines depict the median values for each group and individual values are shown as dots. The recovered patients (n=17) are plotted in black and not recovered (n=6) plotted in red. Plotted markers include: (A) D-dimer, (B) C-reactive protein, (C) ferritin, (D) absolute lymphocyte count, (E) absolute neutrophil count, (F) absolute monocyte count, (G) ratio of neutrophils to lymphocytes. (H) The number of patients followed in each group is plotted, where the black and red lines indicate the recovered and non-recovered groups respectively. (I) The C-reactive protein levels for three participants are plotted. Note that participants I and K received no other antiviral or immunomodulatory treatments at any time, while participant J was in a remdesivir versus placebo trial from days -10 to -1, and received treatment dose steroid from days 1 to 3.

Figure 1

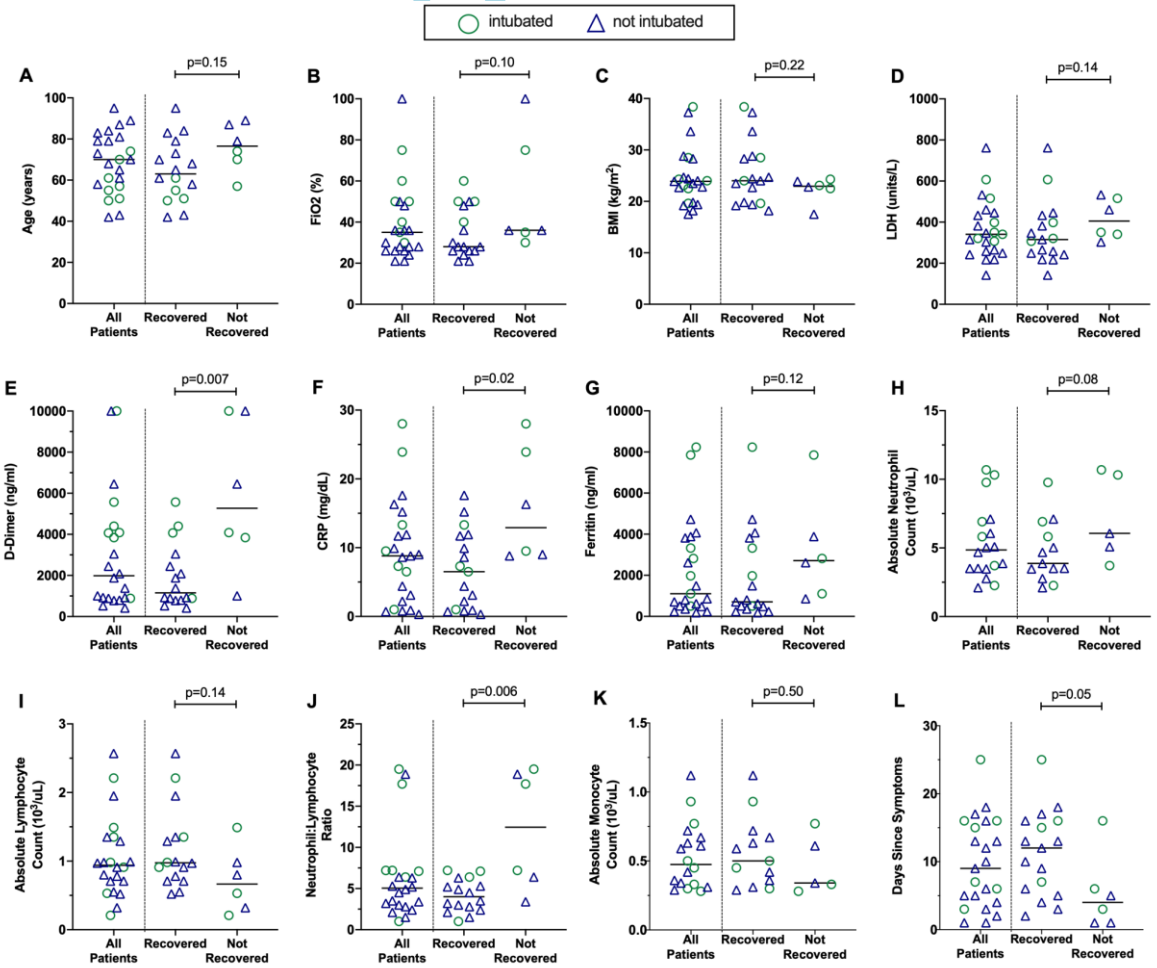
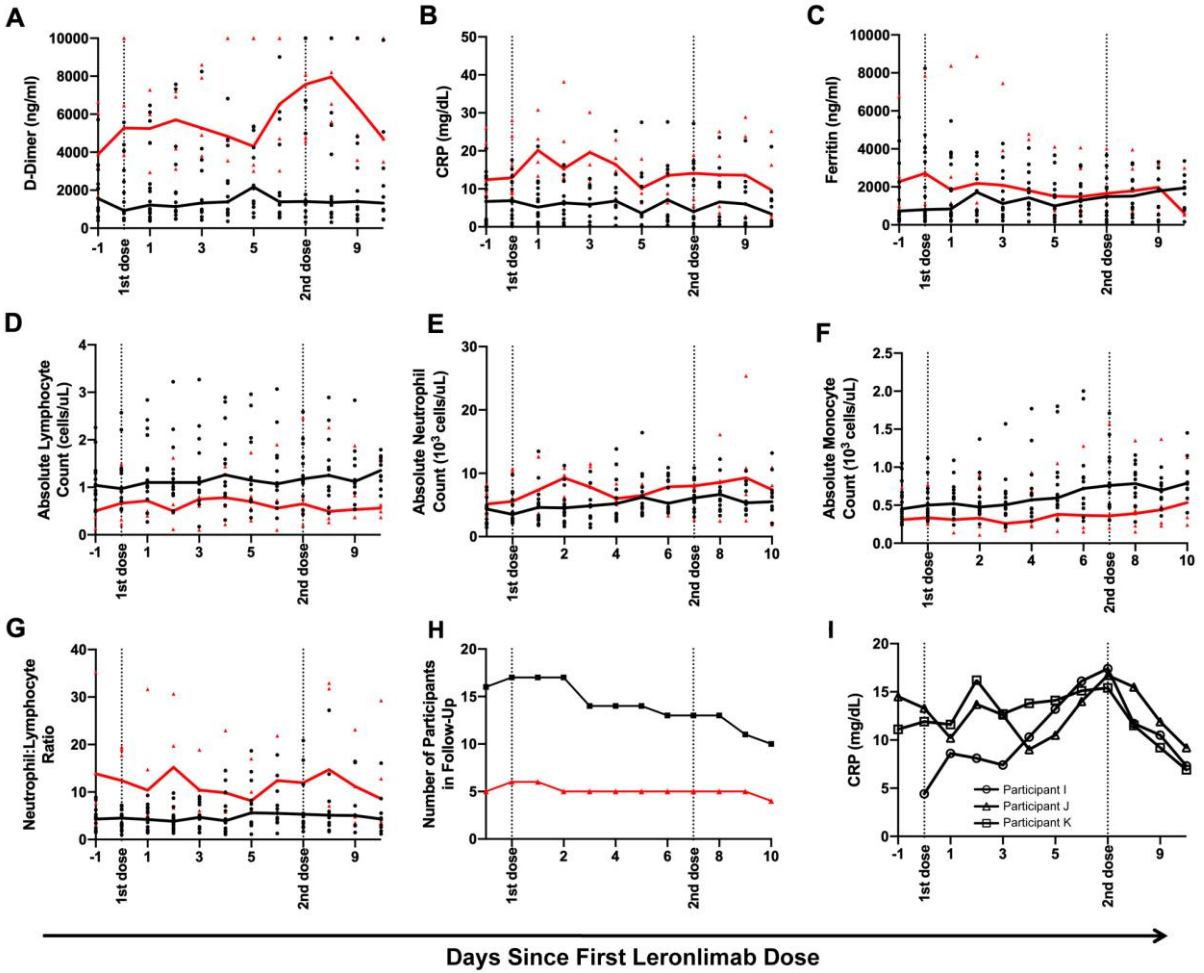

intubated
not intubated
A
p=0.15
Age (years)
B
p=0.10
FiO2 (%)
C
p=0.22
BMI (kg/m²)
D
p=0.14
LDH (units/L)
E
p=0.007
D-Dimer (ng/ml)
F
p=0.02
CRP (mg/dL)
G
p=0.12
Ferritin (ng/ml)
H
p=0.08
Absolute Neutrophil Count (10³/uL)
I
p=0.14
Absolute Lymphocyte Count (10³/uL)
J
p=0.006
Neutrophil:Lymphocyte Ratio
K
p=0.50
Absolute Monocyte Count (10³/uL)
L
p=0.05
Days Since Symptoms
All Patients
Recovered
Not Recovered

Figure 2


A
D-Dimer (ng/ml)
B
CRP (mg/dL)
C
Ferritin (ng/ml)
D
Absolute Lymphocyte Count (cells/uL)
E
Absolute Neutrophil Count (10^3 cells/uL)
F
Absolute Monocyte Count (10^3 cells/uL)
G
Neutrophil:Lymphocyte Ratio
H
Number of Participants in Follow-Up
I
CRP (mg/dL)
Participant I
Participant J
Participant K
1st dose
2nd dose
Days Since First Leronlimab Dose