

# Clinical characteristics of hospitalized patients with COVID-19 in Yueyang, Hunan, China

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## Research Article

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# Abstract

The clinical characteristics of patients with novel coronavirus disease (COVID-19) in Hunan Province are less understood. We analyzed retrospectively the epidemiological, clinical characteristics, and risk factors associated with severity of 113 confirmed COVID-19 cases in Yueyang, Hunan Province, China, from January 20, 2020, to March 8, 2020, and followed until April 13, 2020. Of the 113 confirmed cases, 92 (81.4%) were from or infected by patients from Hubei province. More than half (63) of patients with COVID-19 had no fever in the early stages of disease. 23% patients had no symptoms at the onset. As of March 8, 2020, 113 (100%) of 113 patients had met the discharge criteria, 0 (0%) patients died. Compared with the non-severe cases, severe cases were associated with older age or patients with comorbidities, secondary bacterial infections, and higher levels of C-reactive protein. Longer duration of virus clearance was associated with a higher risk of progression to critical status. Older patients or patients with comorbidities such as diabetes were more likely to have severe condition. Prompt and effective treatment and sufficient medical resources may still significantly reduce hospital-related transmissions and mortality.

## Introduction

In December 2019, a series of cases of pneumonia with unknown cause, now known as Corona Virus Disease 2019 (COVID-19), had been reported in Wuhan, China<sup>1</sup>. Soon after, other areas across the country reported outbreaks, and as of April 29, 2020, a total of 82,862 COVID-19 cases in China have been confirmed with 4633 deaths<sup>2</sup>. Unfortunately, the number of infections and deaths is still increasing in the rest of the world<sup>3-5</sup>.

At present, information regarding the epidemiological, clinical characteristics, and risk factors of COVID-19 in Hunan province is limited. Yueyang, adjacent to Wuhan, is the second largest prefecture-level city in Hunan province with a population of 5.77 million. There are a large number of people working and studying in Wuhan. Therefore, Yueyang has become one of the main epidemic areas of imported cases. In a retrospective study from Wuhan, the estimated mortality rate was 1.1% for non-critical patients and 32.5% for critical patients<sup>6</sup>. Another report from the city analyzed the clinical characteristics of 138 hospitalized patients with COVID-19 in Wuhan. They reported 26% of patients received ICU care and the mortality rate was 4.3%<sup>7</sup>. However, these studies may not represent the realities in the cities outside of Wuhan.

This study describes the epidemiological, clinical characteristics, and risk factors associated with severity of 113 confirmed COVID-19 cases in Yueyang, Hunan Province.

## Results

### Demographic and clinical characteristics

A total of 113 patients with confirmed COVID-19 were included in the study. The demographic and clinical characteristics were summarized in Table 1. The median age of all patients was 48 years (IQR, 34-59). 49.6% of all patients were male. The median age of severe patients was older than that of non-severe patients (median, years, 63 vs 45,  $p = 0.001$ ). The median weight was 60 kg (53-68). 32 (28.3%) patients were imported cases from Hubei province, 60 (53.1%) had not been to Hubei Province but were infected by patients from Hubei, and the remaining 21 (18.6%) had no clear contact history. A small number of patients had preexisting comorbidities including diabetes (8.8%), hypertension (10.6%), cardiovascular disease (3.5%), COPD (2.7%), Chronic kidney disease (3.5%), Chronic liver disease (7.1%) or HIV infection (0.9%). The most common symptom at onset of illness was cough (68 [60.2%]) and fever (50 [44.2%]), but 23% patients had no symptoms at the onset. For the 26 people with no symptoms, 10 cases had early mild lung lesions, and 16 cases had a normal CT. Compared with non-severe cases, severe cases exhibited more diabetes (45.5% vs 4.9%,  $p=0.001$ ) and symptoms, including fever (90.9% vs 39.2%,  $p=0.003$ ), chest Congestion (54.5% vs 8.8%,  $p<0.001$ ), dyspnea (54.5% vs 2.9%,  $p<0.001$ ). There are different epidemiological histories between severe and non-severe patients ( $p=0.009$ ).

Table 1. Baseline Characteristics of Patients With COVID-19

Characteristics	Total (n=113)	Non-severe (n=102, 90.3%)	Severe (n=11, 9.7%)	P value
Age (median [IQR])	48.00 [34.0, 59.0]	45.00 [31.3, 58.0]	63.00 [53.0, 68.5]	0.001
Sex, N (%)				
Female	57 (50.4)	52 (51.0)	5 (45.5)	0.975
Male	56 (49.6)	50 (49.0)	6 (54.5)	
Weight (kg, median [IQR])	60.0 [53.0, 68.0]	60.0 [53.0, 67.6]	67.0 [57.0, 70.5]	0.149
Epidemiology information, N (%)				
Without any clear contact history	21 (18.6)	17 (16.7)	4 (36.4)	0.009
Not been to Hubei, but infected by patients	60 (53.1)	59 (57.8)	1 (9.1)	
From Hubei	32 (28.3)	26 (25.5)	6 (54.5)	
Comorbidities, N (%)				
Diabetes	10 (8.8)	5 (4.9)	5 (45.5)	0.001
Hypertension	12 (10.6)	11 (10.8)	1 (9.1)	1.000
Cardiovascular disease	4 (3.5)	3 (2.9)	1 (9.1)	0.340
COPD	3 (2.7)	2 (2.0)	1 (9.1)	0.267
Chronic kidney disease	4 (3.5)	3 (2.9)	1 (9.1)	0.340
Chronic liver disease	8 (7.1)	7 (6.9)	1 (9.1)	0.571
HIV infection	1 (0.9)	1 (1.0)	0 (0.0)	1.000
Signs and symptoms, N (%)				
Fever	50 (44.2)	40 (39.2)	10 (90.9)	0.003
Cough	68 (60.2)	59 (57.8)	9 (81.8)	0.223
Fatigue	31 (27.4)	26 (25.5)	5 (45.5)	0.292
Chest Congestion	15 (13.3)	9 (8.8)	6 (54.5)	<0.001
Dyspnea	9 (8.0)	3 (2.9)	6 (54.5)	<0.001
Sore throat	15 (13.3)	13 (12.7)	2 (18.2)	0.639
Diarrhea	6 (5.3)	6 (5.9)	0 (0.0)	1.000
Myalgia	18 (15.9)	15 (14.7)	3 (27.3)	0.378
Headache	5 (4.4)	5 (4.9)	0 (0.0)	1.000
Asymptomatic	26 (23.0)	26 (25.5)	0 (0.0)	0.066

## Laboratory and radiographic findings on admission

As shown in Table 2, lymphocytes ( $P = 0.001$ ) and white blood cell ( $p = 0.041$ ) were significantly decreased in severe patients. Compared with non-severe patients, the C-reactive protein (CRP,  $p < 0.001$ ), procalcitonin (PCT,  $p = 0.001$ ) and lactate dehydrogenase (LDH,  $p = 0.027$ ) were significantly increased in severe patients. No significant differences in serum biochemical indexes of the liver (ALT and TBIL) and kidney (BUN and Cr), hemoglobin (HGB), platelet count (PLT), erythrocyte sedimentation rate (ESR) and D-dimer were observed between severe and non-severe patients at admission. Of the chest CT images of the 113 patients, 17 (15%) had no change, 75 (66.4%) were mild, 15 (13.3%) were in advanced stage, and 6 (5.3%) were severe on admission. Figure 1 is a typical patient's chest CT from mild to severe stages.

Table 2. Laboratory and Imaging Characteristics of Patients With COVID-19 on Admission to Hospital.

Characteristics	Normal Range	Overall (n = 113)	Non-severe (n = 102)	Severe (n = 11)	P value
Laboratory, Median [IQR]					
WBC, $\times 10^9/L$	3.5 - 9.5	4.8 [3.6, 6.1]	4.9 [3.8, 6.2]	3.3 [2.7, 4.8]	0.041
N, $\times 10^9/L$	1.8 - 6.3	2.8 [2.1, 3.6]	2.8 [2.1, 3.6]	2.1 [1.9, 3.2]	0.245
L, $\times 10^9/L$	1.1 - 3.2	1.2 [0.9, 1.7]	1.3 [0.9, 1.9]	0.7 [0.5, 1.1]	0.001
HGB, g/L	115 - 150	130.0 [119.0, 140.0]	130.0 [120.2, 140.0]	125.0 [115.0, 137.5]	0.444
PLT, $\times 10^9/L$	125 - 350	178.0 [128.0, 240.0]	181.5 [139.3, 241.5]	129.0 [106.5, 208.0]	0.243
CRP, mg/L	0 - 10	12.0 [1.7, 33.7]	9.4 [1.6, 24.4]	52.2 [39.2, 58.6]	<0.001
PCT, ng/mL	< 0.05	0.05 [0.04, 0.08]	0.05 [0.04, 0.07]	0.09 [0.08, 0.11]	0.001
ESR, mm/h	10.0 - 20.0	34.0 [16.0, 45.0]	34.0 [15.0, 45.0]	42.0 [31.0, 64.5]	0.058
AST, U/L	13 - 35	25.7 [19.4, 31.2]	25.1 [19.2, 30.3]	29.8 [26.5, 41.1]	0.035
ALT, U/L	7 - 40	20.8 [14.4, 30.8]	20.3 [14.4, 30.0]	30.5 [15.5, 51.0]	0.257
TBIL, $\mu\text{mol/L}$	1.7 - 25.0	14.3 [10.0, 20.0]	14.2 [10.6, 19.3]	14.9 [9.6, 22.6]	0.892
CK, U/L	40 - 200	81.1 [54.2, 128.7]	79.3 [51.2, 124.5]	109.7 [69.7, 205.9]	0.145
CK-MB, U/L	0 - 24	13.1 [10.2, 17.1]	13.1 [10.1, 17.1]	11.6 [11.2, 15.3]	0.907
LDH, U/L	120 - 250	203.9 [167.7, 250.8]	195.2 [167.0, 243.5]	269.2 [219.6, 333.2]	0.027
BUN, mmol/L	2.6 - 7.5	4.2 [3.5, 5.4]	4.0 [3.4, 5.0]	4.7 [4.4, 6.4]	0.043
CR, $\mu\text{mol/L}$	41 - 73	63.7 [53.8, 76.0]	63.7 [53.5, 74.6]	78.6 [57.3, 99.2]	0.104
D-dimer, mg/L	0 - 500	230.0 [160.0, 367.0]	230.0 [160.0, 350.0]	340.0 [185.0, 630.0]	0.167
Imaging diagnosis, N (%)					
Normal		17 (15.0)	17 (16.7)	0 (0.0)	<0.001
Early		75 (66.4)	75 (73.5)	0 (0.0)	
Advanced		15 (13.3)	10 (9.8)	5 (45.5)	
Severe		6 (5.3)	0 (0.0)	6 (54.5)	

**Abbreviations:** WBC, white blood cell; N, neutrophil count; L, lymphocyte count; HGB, hemoglobin; PLT, platelet count; CRP, C-reactive protein; PCT, procalcitonin; ESR, erythrocyte sedimentation rate; AST, glutamic oxaloacetic transaminase; ALT, aspartate aminotransferase; TBIL, total bilirubin abnormal; CK, creatine kinase; CK-MB, creatine kinase-MB; LDH, lactate dehydrogenase; BUN, Blood Urea Nitrogen; CR, creatinine.

## Disease progression, complications, treatment and clinical outcomes

As shown in Table 3, the duration of fever (7 vs 2,  $p = 0.02$ ), days from symptom onset to virus clearance (24 vs 15.5,  $p < 0.001$ ), days from symptom onset to pneumonia resolution (28 vs 17,  $p < 0.001$ ) and length of hospital stay (21 vs 11,  $p < 0.001$ ) were longer among severe patients than non-severe patients. In the hospitalization and follow-up period, the complications of COVID-19 were assessed, including secondary bacterial infections (8%), pulmonary fibrosis (2.7%) and acute respiratory distress syndrome (ARDS) (8%). All the above-mentioned complications were more common in 11 severe cases, compared

with non-severe cases (all  $P < 0.05$ ). Antiviral drugs were used specifically to treat COVID-19 during hospitalization, including lopinavir/ritonavir (77.9%), arbidol (90.3%), oseltamivir (39.8%) and chloroquine (10%). For severe cases, methylprednisolone (1-2 mg/kg/d) for 3-5 days combined with human gamma-globulin (10-20 g/d) was prescribed. Seven patients received ICU care, and 3 cases received invasive mechanical ventilation. Interferon inhalation was used in almost all patients. As of March 8, 2020, 113 (100%) of 113 patients had met the discharge criteria. 0 (0%) patients died.

Table 3. Disease Progression, Complications, Treatments and Outcome of Patients With COVID-19

Characteristics	Overall (n = 113)	Non-severe n = (102)	Severe n = (11)	P value
<b>Disease progression, median [IQR]</b>				
Duration of fever	3.0 [0.0, 4.0]	2 [0.0, 4.0]	7.0 [4.0, 8.0]	0.02
Peak temperature	37.3 [36.8, 38.4]	37.0 [36.8, 38.0]	38.5 [38.2, 39.0]	0.001
From onset to hospitalization	6.0 [3.0, 9.0]	5.0 [3.0, 9.8]	6.0 [4.5, 7.0]	0.946
From onset to viral clearance	16.0 [12.0, 22.0]	15.5 [11.0, 20.8]	24.0 [20.5, 28.5]	<0.001
From onset to pneumonia resolution	18.0 [12.0, 24.0]	17.0 [11.3, 22.0]	28.0 [25.0, 40.5]	<0.001
Length of hospital stay	12.0 [9.0, 18.0]	11.0 [9.0, 16.0]	21.0 [18.0, 32.5]	<0.001
<b>Complications, N (%)</b>				
Secondary bacterial infections	9 (8.0)	2 (2.0)	7 (63.6)	<0.001
Pulmonary fibrosis	3 (2.7)	0 (0.0)	3 (27.3)	0.001
ARDS	9 (8.0)	2 (2.0)	7 (63.6)	<0.001
Shock	1 (0.9)	0 (0.0)	1 (9.1)	0.097
<b>Treatment, N (%)</b>				
Lopinavir/ritonavir	88 (77.9)	78 (76.5)	10 (90.9)	0.475
Arbidol	102 (90.3)	92 (90.2)	10 (90.9)	1
Oseltamivir	45 (39.8)	37 (36.3)	8 (72.7)	0.043
Chloroquine	10 (8.8)	10 (9.8)	0 (0.0)	0.597
Gamma-globulin	23 (20.4)	13 (12.7)	10 (90.9)	<0.001
Corticosteroid	10 (8.8)	1 (1.0)	9 (81.8)	<0.001
Need ICU care	7 (6.2)	0 (0.0)	7 (63.6)	<0.001
Invasive mechanical ventilation	3 (2.7)	0 (0.0)	3 (27.3)	0.001
<b>Outcome, N (%)</b>				
Discharge	113 (100)	102 (90.3)	11 (9.7)	0.172

### Risk factors for severe cases

In the multivariable binary stepwise logistic regression model, variables such as secondary bacterial infections (OR 3.43; 95% CI 3.69-6.53), duration of virus clearance (OR 1.16; 95% CI 1.04-1.34), CRP (OR 1.04; 95% CI 1.01-1.08) were significantly associated with severe cases with COVID-19 (Table 4).

Table 4. Risk factors associated with progression to severity

Variables	OR (95% CI)	P value
Secondary bacterial infections	3.43 (3.69-6.53)	0.005
From onset to viral clearance (d)	1.16 (1.04-1.34)	0.018
Fever	4.00 (1.70-5.95)	0.071
CRP	1.04 (1.01-1.08)	0.032

**Note:** Multivariable binary stepwise logistic regression analysis was used to assess risk factors associated with progression to severity, with factors included age, gender, weight, epidemiology information, comorbidity, fever, lymphocyte count (L), C-reactive protein (CRP), lactate dehydrogenase (LDH), duration of virus clearance, secondary bacterial infections.

## Factors affecting virus clearance

In order to assess factors affecting virus clearance, duration of virus clearance is converted into an ordered variable:  $\leq 15d$ , 15-30d,  $>30d$ . The Kruskal-Wallis test found that the rate of patient progress to severe clinical condition was correlated with the duration of virus clearance ( $P = 0.0025$ ), as shown in Figure 2. In ordered logistic regression model, comorbidity was the only independent prognostic factor of viral clearance (OR 4.85; 95% CI 1.11-22.07,  $P = 0.037$ ) (Table 5).

Table 5. Factors Associated with Viral Clearance in Ordered Logistic Regression Analysis.

Variables	OR (95% CI)	P value
Age	1.01 (0.99-1.04)	0.335
Gender (Male)	0.46 (0.20-1.03)	0.060
Epidemiology information		
Not been to Hubei vs Without any clear contact history	2.12 (0.63-7.44)	0.231
From Hubei vs Not been to Hubei	0.84 (0.24-2.95)	0.781
Comorbidity	4.85 (1.11-22.07)	0.037
Fever	1.49 (0.64-3.52)	0.354
Secondary bacterial infections	0.94 (0.14-6.72)	0.954
Imaging diagnosis		
Early vs Normal	1.53 (0.40-5.93)	0.529
Advanced vs Early	2.05 (0.30-14.38)	0.465
Severe vs Advanced	4.17 (0.28-62.31)	0.296
L	1.13 (0.85-1.50)	0.380
CRP	1.01 (0.99-1.03)	0.356
LDH	0.99 (0.99,1.00)	0.275
Weight	0.99 (0.96-1.02)	0.582

**Note:** Duration of virus clearance is converted into an ordered variable:  $\leq 15d$ , 15-30d,  $>30d$ .

**Abbreviations:** L, lymphocyte count; CRP, C-reactive protein; LDH, lactate dehydrogenase.

## Discussion

Data on COVID-19 in Hunan province are very limited. This study provided a comprehensive data on the demographic, epidemiological, laboratory, and radiological characteristics as well as the comorbidities, treatment, and outcomes of inpatients with non-severe and severe COVID-19 in Yueyang, Hunan province. 11 (9.7%) patients in this study were identified as severe cases and mortality was 0%, which differ from the results of Wuhan<sup>1,6,7</sup>.

Of the 113 confirmed cases, 92 (81.4%) were from or infected by patients from Hubei province, which indicate the importance of disease control measures, especially in the case of peak numbers in areas such as Wuhan, in order to prevent ongoing transmission and contact with close contacts. Severe patients were older and had comorbidities such as diabetes more often than non-severe patients. Therefore, high-quality medical treatment should be given priority to older patient. As shown in the previous studies<sup>7</sup>, there were no gender difference between severe and non-severe patients in our study. For SARS patients, fever was almost always the first clinical symptom commonly<sup>13</sup>. However, our data showed more than half (63) of COVID-19 patients had no fever in the early stages of disease. This means

that screening a population using a thermometer alone is not enough, and that screening criteria should include other indications.

In previous retrospective study of COVID-19 in Wuhan City<sup>1</sup>, nearly 1/3 of patients were admitted to the intensive care unit (ICU). In our study, the patients presenting to the hospital were mostly non-severe (90.3%) cases. Although the rate of progression from non-severe to severe cases is not as high as that of SARS or MERS (ranging from 70% to 90%)<sup>14,15</sup>, prompt and effective treatment may still significantly reduce hospital-related transmissions and mortality.

According to the suggestion of Diagnosis and Treatment of COVID-19 (version 7)<sup>10</sup>, all of the patients in this study received antiviral therapy (lopinavir/ritonavir or arbidol), aerosol inhalation of interferon-alpha and traditional Chinese medicine treatment. Until now, all treatments have relied on meticulous supportive care and improved immunity. Specific antiviral drugs for COVID-19 are being developed, but this process may take time. In addition, among our cohort of 113 confirmed patients with COVID-19, glucocorticoid was used in 1% of non-severe patients and 81.8% of severe patients. However, the use of glucocorticoid remains controversial. One study showed that clinical evidence did not support glucocorticoid therapy for COVID-19, nor did the benefits of glucocorticoid-supported therapy be observed<sup>16</sup>. Risk factors for severity identified in this study included secondary bacterial infections, duration of virus clearance and CRP, consistent with those in previous reports<sup>6,17,18</sup>. However, different from previous studies<sup>19</sup>, our logistic regression analysis results showed comorbidity was identified as an independent risk factor for viral clearance.

Our study had several notable limitations. First, since this was a single-center retrospective study, the results could not be generalized. Second, because some severe patients were directly transferred to provincial medical institutions for treatment, only a few severe patients were monitored in this study. Additionally, the long-term complications of COVID-19 could not be fully assessed due to limited study time.

## Methods

### Study Design and Participants

Since January 20, 2020, most patients diagnosed with COVID-19 in Yueyang City have been transferred to the Frist People's Hospital of Yueyang. All patients with COVID-19 enrolled in this study were diagnosed according to the interim guidance from the World Health Organization<sup>8</sup>. The clinical outcomes (discharges, mortality, length of stay) were monitored until April 13, 2020, the final date of follow-up. Acute respiratory distress syndrome (ARDS) was defined according to the Berlin definition<sup>9</sup>. For severe and non-severe cases, refer to Diagnosis and Treatment of COVID-19 (version 7) issued by National Health Commission of the People's Republic of China<sup>10</sup>. Severe cases is defined according to one of the following: (1) Respiratory distress and the respiratory rate (RR)  $\geq$  30 times/min; (2) In a resting state,

transcutaneous oxygen saturation ( $\text{SaO}_2$ )  $\leq 93\%$ ; (3) Oxygenation index( $\text{PaO}_2/\text{FiO}_2$ )  $\leq 300$  mmHg; (4) Pulmonary imaging showed that the lesion progressed more than 50% at 24-48 hours.

### **Image assessment method**

Images were assessed according to Imaging of Coronavirus Disease 2019: A Chinese expert consensus statement<sup>11</sup>. Typical CT findings included bilateral pulmonary parenchymal ground-glass opacity (GGO) and consolidative pulmonary opacities, sometimes with a rounded morphology and a peripheral lung distribution<sup>12</sup>. The computed tomography (CT) scans were divided into four stages: (1) Early-stage: CT showed lung focal single or multiple GGO, mainly distributed in the foreign lung field, and the lower leaf is more common; (2) Advanced stage: Disease progression mostly occurs in a course of 7-10 days, with enlarged and increased density of GGO, and consolidated lesions with air bronchogram sign. GGOs from the early stage expand, and the density increases gradually; (3) Severe stage: Pulmonary imaging may show further expansion of consolidations and diffuse distribution, involving the center and periphery of the lung. More than 2/3 of the lung field was timely affected by lesions, a so-called "white lung". Some studies have shown that the lesion significantly progresses to more than 50% within 24 to 48 hours, indicating that the patients were severe. (4) Recovery stage: The lesion area is reduced and absorbed, or only residual fibrous lesions are seen. These four stages in a 56-year-old male patient are shown in Figure 1.

### **Data collection**

In this retrospective study, we collected data of all the hospitalized patients with COVID-19 from January 20, 2020, to March 8, 2020, and all confirmed cases were followed up to April 13, 2020. The medical records of patients were collected and analyzed from electronic medical records by the research team of the Department of Critical Care Medicine, Xiangya Hospital Centre South University. Demographic information, epidemiological history, laboratory findings, clinical characteristics, chest computed tomographic (CT) scans, treatment and outcomes data were obtained with data collection forms.

### **Statistical analysis**

The median for continuous variables were compared by using Mann-Whitney test. Unordered categorical variables were compared using the chi square test, and the Fisher exact test was used when the sample was limited. Kruskal-Wallis test was used to compare ordered categorical variables across groups.

Multivariable binary stepwise logistic regression analysis was used to assess risk factors associated with progression to severity. Ordered logistic regression analysis was applied to evaluate the factors affecting virus clearance (duration of virus clearance is converted into an ordered variable:  $\leq 15\text{d}$ ,  $15\text{-}30\text{d}$ ,  $>30\text{d}$ ). All statistical analyses were performed using R (version 3.6.3). The ggplot2 package was used to plot. A two-tailed p value of less than 0.05 was considered to be statistically significant.

### **Data Availability**

All data generated or analyzed during this study are included in this published article.

## Declarations

**Author contributions** CG performed the literature search, reviewed articles, completed the data analysis using the R (version 3.6.3) and wrote the manuscript. LW and KD collected clinical information of patients with COVID-19. YJ and QP reviewed the articles and provided secondary reviews during the manuscript preparation. JY designed the analysis and revised the manuscript.

**Competing interests** There is no conflict of interest.

**Informed consent** Because of the retrospective nature of the study, the Ethics Committee of the Frist People's Hospital of Yueyang determined that no patient consent was required.

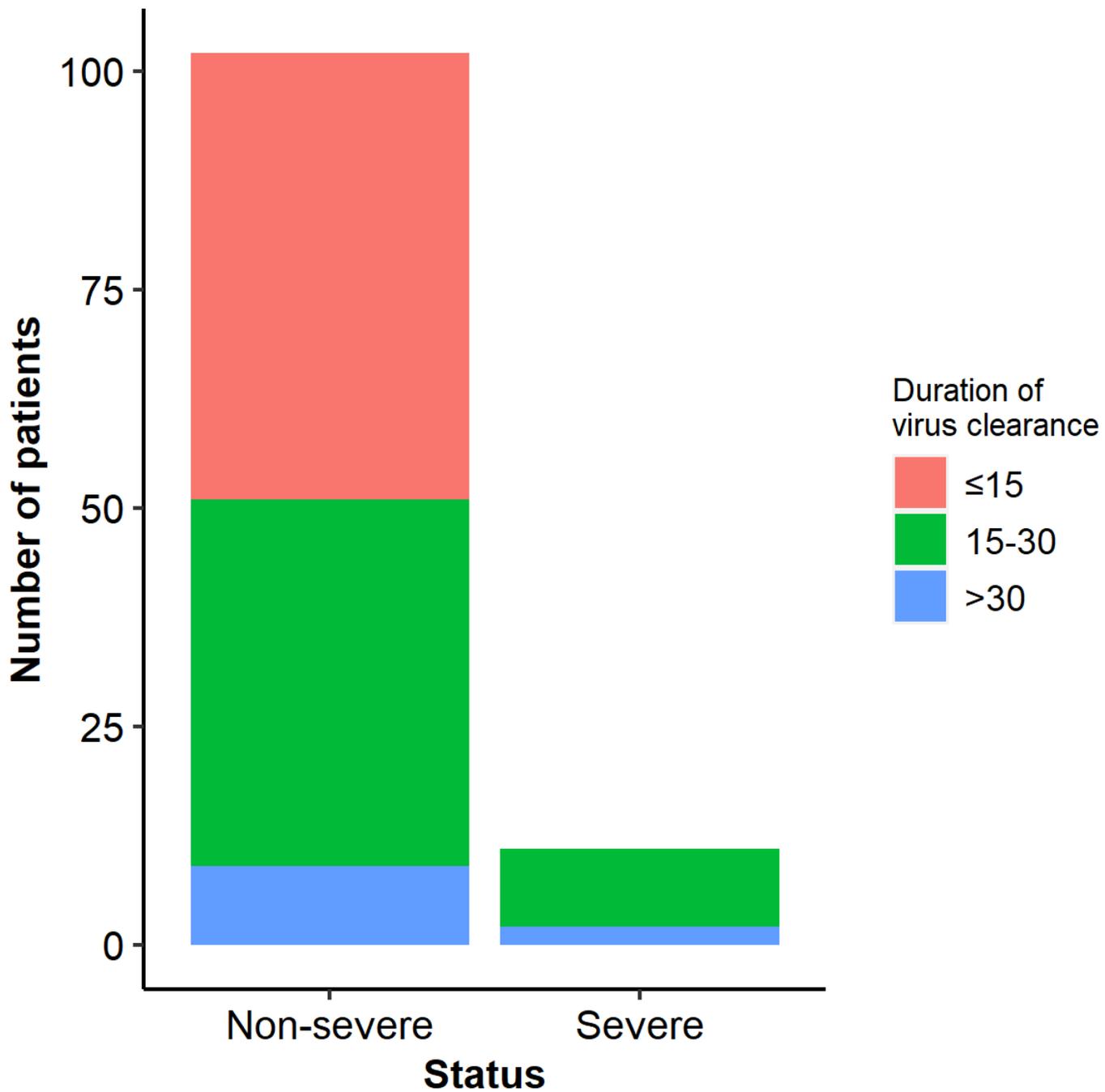
**Ethics approval** All experimental protocols were approved by the Ethics Committee of the Frist People's Hospital of Yueyang. All methods were carried out in accordance with relevant guidelines and regulations.

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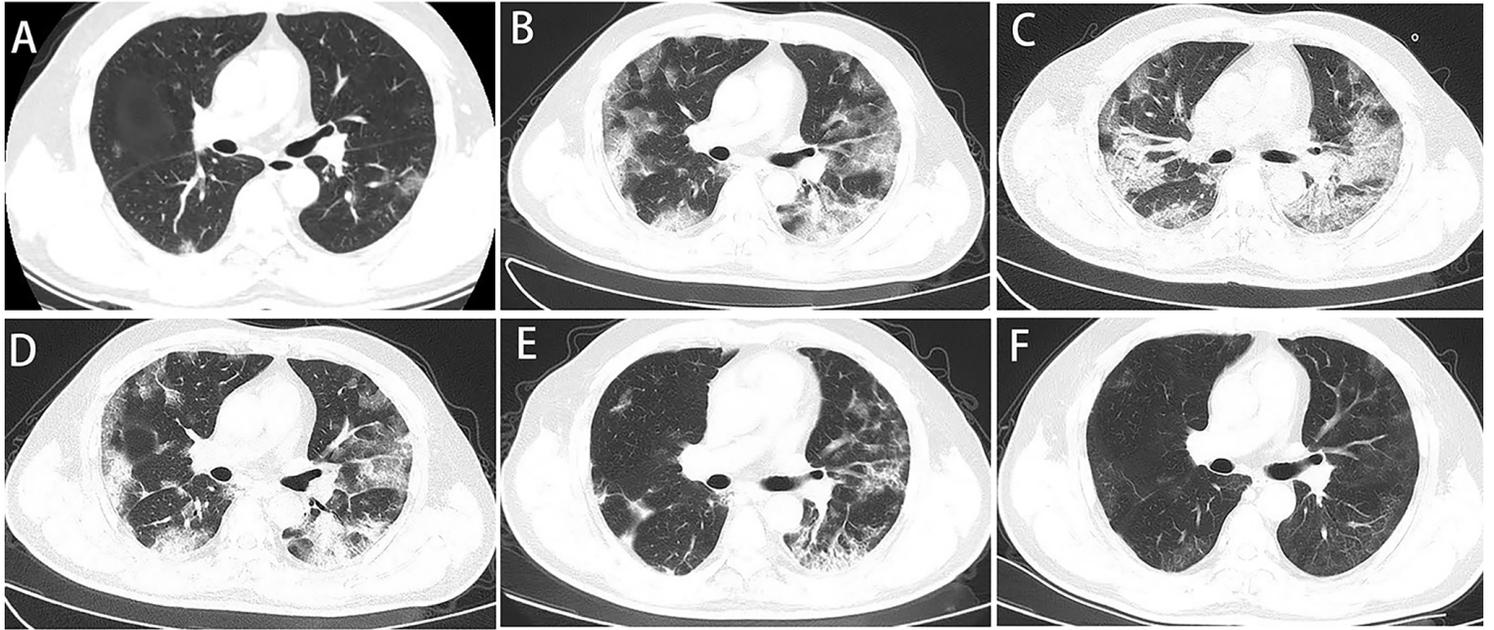
## Figures



(Kruskal-Wallis Test, P=0.0025)

Figure 1

Association Between Illness Status and Duration of Viral Clearance. Note: The Kruskal-Wallis test found that longer duration of virus clearance was associated with a higher risk of progression to critical status. (P = 0.0025).



**Figure 2**

The Imaging Change of a 56-Y-Old Male Patient With COVID-19. Note: A, Chest computed tomographic images obtained on January 25, 2020, show ground glass opacity (GGO) in both lungs on day 3 after symptom onset. B and C, Images taken on January 30 and February 5 respectively, show enlarged and increased density of GGO. D and E, Images taken on February 12 and February 27 respectively, show the absorption of bilateral GGO. F, Images taken on April 13, basically returned to normal.