

Table S1 Diagnostic criterion of clinical types for COVID-19 (11)

Diagnostic criterion	Type
The clinical symptoms are mild with no abnormal radiological findings	Mild
Fever and respiratory symptom are presented with pneumonia on radiography	Moderate
If any of the following conditions is met: Shortness of breath, respiratory rate ≥ 30 /min; Oxygen saturation at rest $\leq 93\%$; $\text{PaO}_2/\text{FiO}_2 \leq 300$ mmHg	Severe
Patients with $>50\%$ lesions progression within 24 to 48 hours in chest CT scan	
If any of the following conditions is met: Respiratory failure occurs and mechanical ventilation is required; Shock occurs; Combined with other organ function failure requiring monitoring and treatment in ICU	Critical ill

PaO_2 , Partial pressure of arterial oxygen; FiO_2 , fraction of inspired oxygen; ICU, intensive care unit.

Table S2 Diagnostic criteria of complications for COVID-19

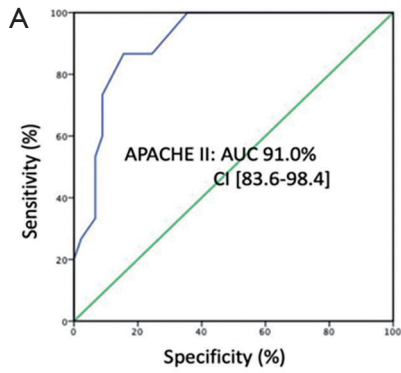
Diagnostic criterion	Complication
Onset: within 1 week of a known clinical insult or new or worsening respiratory symptoms. Chest imaging (radiograph, CT scan, or lung ultrasound): bilateral opacities, not fully explained by volume overload, lobar or lung collapse, or nodules. Origin of pulmonary infiltrates: respiratory failure not fully explained by cardiac failure or fluid overload. Need objective assessment (e.g., echocardiography) to exclude hydrostatic cause of infiltrates/oedema if no risk factor present. Oxygenation impairment in adults: Mild ARDS: $200 \text{ mmHg} < \text{PaO}_2/\text{FiO}_2 \leq 300 \text{ mmHg}$ (with PEEP or CPAP $\geq 5 \text{ cmH}_2\text{O}$, or non-ventilated) Moderate ARDS: $100 \text{ mmHg} < \text{PaO}_2/\text{FiO}_2 \leq 200 \text{ mmHg}$ (with PEEP $\geq 5 \text{ cmH}_2\text{O}$, or non-ventilated) Severe ARDS: $\text{PaO}_2/\text{FiO}_2 \leq 100 \text{ mmHg}$ (with PEEP $\geq 5 \text{ cmH}_2\text{O}$, or non-ventilated) When PaO_2 is not available, $\text{SpO}_2/\text{FiO}_2 \leq 315$ suggests ARDS (including in non-ventilated patients).	ARDS (13)
Serum levels of cardiac biomarkers (e.g., cardiac troponin I) were $>$ the 99th percentile upper reference limit, or new abnormalities were shown in electrocardiography and echocardiography.	Acute cardiac injury (15)
Jaundice with a total bilirubin level of $\geq 3 \text{ mg/dl}$ and an acute increase in alanine aminotransferase of at least five times the upper limit of the normal range and/or an increase in alkaline phosphatase of at least twice the upper limit of the normal range.	Acute liver injury (13)
Identified on basis of the highest serum creatinine level according to the kidney disease improving global outcomes classification.	Acute kidney injury (14)
Persisting hypotension despite volume resuscitation, requiring vasopressors to maintain MAP $\geq 65 \text{ mmHg}$ and serum lactate level $>2 \text{ mmol/L}$.	Septic shock (13)

PaO_2 , Partial pressure of arterial oxygen; FiO_2 , fraction of inspired oxygen; ARDS, acute respiratory distress syndrome; PEEP, positive end expiratory pressure; CAPA, continuous positive airway pressure; MAP, mean artery pressure.

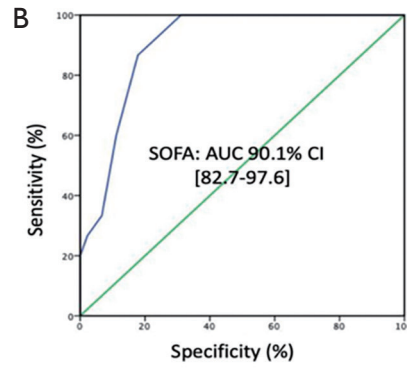
Table S3 Demographic, clinical characteristics and treatment of severe young patients who died

Case	Age (years)	Sex	Initial symptoms and signs	Time ^a (day)	Disease type	Coexisting illness	Methylprednisolone ^b	Antiviral therapy	Antibacterial therapy	Other therapy	Complications	Time ^c (days)
1	31	M	Fever/Tmax 39 °C	13	Critical	No	80mg BID	Oseltamivir/ribavirin	Cefoperazone/moxifloxacin/ imipenem	rhIFN α /HFNC	ARDS/PT/PD	5
2	34	F	Dyspnea	5	Critical	Malignancy	80mg QD	Ribavirin	Cefoperazone/moxifloxacin/ imipenem	HFNC	ARDS/ALI/bacteremia	5
3	47	M	Dry Cough	7	Critical	HT/schizophrenia	40mg QD	Oseltamivir/ribavirin	Cefperazone-Sulbactam/ moxifloxacin	Lianhuaqingwen/HFNC	ARDS	1
4	47	M	Fever/Tmax 39 °C	13	Severe	Bronchiectasis	40mg Q8H	Ribavirin	Cefoperazone/moxifloxacin	rhIFN α /lianhuaqingwen/ mechanical ventilation	ARDS	7
5	47	M	Fever/Tmax 38.8 °C	18	Critical	No	40mg BID	Arbidol	No	Lianhuaqingwen/mechanical ventilation	ARDS	1
6	50	F	Fever/Tmax 38 °C	9	Severe	No	No	Ribavirin	Moxifloxacin	rhIFN α /lianhuaqingwen/ HFNC	ARDS	4
7	51	M	Fever/Tmax38.9 °C	13	Severe	No	40mg QD	Arbidol	Moxifloxacin/meropenem/ Vancomycin	Andrographolide/HFNC	ARDS	3
8	51	M	Fever/Tmax38.9 °C	9	Severe	HT/DM	No	Oseltamivir	Moxifloxacin	Lianhuaqingwen/HFNC	ARDS/ Hyperglycemia	7
9	52	F	Fever/Tmax 38.5 °C	10	Severe	HT/essential thrombocythemia	40mg BID	Ribavirin	Cefoperazone/moxifloxacin	HFNC	ARDS	1
10	54	M	Fever/Tmax 39 °C	6	Critical	HT	60mg BID	Oseltamivir/arbidol/ ganciclovir	Cefoperazone/moxifloxacin/ azithromycin	Lianhuaqingwen/mechanical ventilation	ARDS/AHI/Viral myocarditis	10
11	56	M	Fever/Tmax 38.9 °C	8	Severe	HT	40mg BID	Oseltamivir/ribavirin	Cefperazone-Sulbactam/ moxifloxacin/	Lianhuaqingwen/HFNC	ARDS/AHI/ALI/ hyperglycemia	8
12	56	M	Fever/Tmax 39 °C	7	Critical	HT/Uremia	No	Arbidol	Moxifloxacin	Lianhuaqingwen/CRRT/ HFNC	ARDS/AHI/AKI	8
13	56	M	Fatigue	15	Critical	HT	80mg QD	No	Imipenem/vancomycin	Fluconazole/HFNC	ARDS/AHI/DIC	3
14	57	M	Fever/Tmax 38 °C	11	Critical	No	No	Oseltamivir/ribavirin	Moxifloxacin	Lianhuaqingwen/HFNC	ARDS/ALI	2
15	58	M	Fever/Tmax 39 °C	26	Severe	HT	40mg BID	Oseltamivir/arbidol	Moxifloxacin	Lianhuaqingwen/HFNC	ARDS	5

^a, time from illness onset to hospital admission; ^b, maximum dose; ^c, length of hospital admission to death. Abbreviations: M, male; F, female; Tmax, maximum body temperature; HT, Hypertension; DM, diabetes mellitus; BID, bis in die; QD, quapua die; Q8H, quapua 8 hora; rhIFN α , recombinant human interferon alfa; HFNC, high-flow nasal cannula oxygen therapy; CRRT, continuous renal replacement therapy; ARDS, acute respiratory distress syndrome; PT, pneumothorax; PD, pneumomediastinum; ALI, acute liver injury; AHI, acute heart injury; AKI, acute kidney injury; DIC, disseminated intravascular coagulation.



Cut off	7	8	9 ^a	10	11
Sensitivity (%)	100	86.7	86.7	73.3	60.0
Specificity (%)	64.4	75.6	84.4	91.1	91.1



Cut off	1	2	3-5 ^a	6	7
Sensitivity (%)	100	100	93.3	60.0	33.3
Specificity (%)	60.0	62.2	75.6	88.9	93.3

Figure S1 ROC curves for APACHE II and SOFA score in predicting in-hospital mortality. Figure demonstrates comparisons of receiver operating characteristic curves in predicting mortality. (A) APACHE II score ability to predict mortality. (B) SOFA score ability to predict mortality. An optimal cutoff according to Youden index. Tables below demonstrate cut off sensitivities and specificities at specific values. ROC, receiver operating characteristic curve; SOFA, sequential organ failure assessment.