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ORIGINAL RESEARCH

Clinico-demographic characteristics of COVID-19

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Abstract
Aim: To evaluate the demographic and clinical features of COVID-19 patients in Jalandhar, India.
Material and method: The present prospective study was conducted among COVID positive patients of both gender was conducted in the NHS Hospital from December 2020 to August 2022. Informed consent of all participants was obtained after explaining the purpose of the study. The study sample comprised of 200 COVID positive patients who were sequentially allocated into study based on their criteria for fulfilling eligibility criteria. COVID-19 was diagnosed on the basis of the WHO interim guidance. A questionnaire was prepared to collect the patients demographic profile. Symptoms included fever, cough, fatigue, muscle ache, sore throat, headache, rhinorrhea, dyspnea, nausea or vomiting, diarrhea, and palpitations.
Results: Mortality was revealed among 13% of the subjects. Mortality due to COVID, co-morbidities and other causes like TB/HIV/MI/COPD was reported among 4%, 6% and 3% of the subjects respectively. Univariate analysis revealed male sex, age>60 years and history of diabetes was significantly associated with mortality as $p<0.05$.
Conclusion: COVID-19 patients >=60 years old, who had diabetes, or who presented with fever, dyspnoea, or lethargy, were more likely to be intubated and ventilated. These patients need to be screened for COVID-19 when presented to any healthcare facility and monitored closely by clinicians upon diagnosis and admission.
Keywords: COVID-19, Mortality, Co-morbidities

Introduction

The 2019 novel coronavirus (2019-nCoV) or COVID-19 as it is now called, is rapidly spreading worldwide from its place of origin in Wuhan City of Hubei Province of China[1]. While the origin of the 2019-nCoV is still being investigated, current evidence suggests

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spread to humans occurred via transmission from wild animals illegally sold in the Huanan Seafood Wholesale Market[2]. The WHO declared Covid-19 a global pandemic on 11th March 2020[3]. Before 3rd March, India had 3 cases of coronavirus in Kerala all of which were treated and discharged[4]. This is the third coronavirus that emerged among the human population in the last two decades. The other two were the severe acute respiratory syndrome coronavirus (SARS-CoV) outbreak in 2002 and the Middle East respiratory syndrome coronavirus (MERS-CoV) outbreak in 2012[5].

Based on the literature, the incubation period of the disease could be up to 14 days[6]. Most cases have mild symptoms of fever, cough, sore throat, and myalgia. However, some cases can present with severe conditions such as multiple organ failure, acute respiratory distress syndrome, pulmonary edema, and pneumonia[7-9]. Based on radiological findings in previous studies, the most frequent CT findings included bilateral pulmonary parenchymal ground-glass and consolidative pulmonary opacities, occasionally with a rounded morphology and a peripheral lung distribution[10,11]. In respect to laboratory data, a decrease in the absolute value of lymphocytes in most patients can be found[12], indicating that the virus may mainly act on lymphocytes, especially T-cells. Damage to T lymphocytes can be a primary factor resulting in exacerbations of patients[13]. In clinical practice, a low absolute value of lymphocytes could assist as a reference index in diagnosing new cases of coronavirus infections. Due to the severity of the disease, with over 20% critical patients and mortality rate of about 3%, COVID-19 is a global health emergency[14]. Therefore, early detection and appropriate treatment of critical cases are of essential importance.

At present, there is a lack of information regarding the demographic and clinical features of COVID-19 patients in the India, especially Uttar Pradesh, a country which is considered as one of the most important focal points of the disease throughout the world. Therefore, this study has been conducted to evaluate the demographic and clinical features of COVID-19 patients in Jalandhar, India.

Material and method

The present prospective study was conducted among COVID positive patients of both gender was conducted in the NHS Hospital from December 2020 to August 2022. Informed consent of all participants was obtained after explaining the purpose of the study. The study sample comprised of 200 COVID positive patients who were sequentially allocated into study based on their criteria for fulfilling eligibility criteria.

Inclusion criteria

All Covid 19 positive patients admitted in the department.

Exclusion criteria

Subjects having following characteristics were excluded from the study:

1. Chronic kidney disease.
2. Chronic liver disease.
3. Congestive heart failure
4. Malignancy
5. <12 year old
6. Patient who didn't give consent

Method

COVID-19 was diagnosed on the basis of the WHO interim guidance. A questionnaire was prepared to collect the patients demographic profile. Symptoms included fever, cough, fatigue, muscle ache, sore throat, headache, rhinorrhea, dyspnea, nausea or vomiting,

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diarrhea, and palpitations. Patients date of admission and discharge was recorded along with the outcome i.e. whether patient was expired or survived. Laboratory investigations comprised of CBC and serum albumin detection.
Chest computed tomography (CT) imaging findings and laboratory findings were recorded. The patients were divided into mild,moderate, and severe, according to clinical symptoms and the prevalence of acute respiratory distress syndrome (ARDS), acute cardiac injury, shock, and acute kidney injury (AKI).

Classification of clinical symptoms
The clinical symptoms of patients in both groups of cluster and sporadic cases of COVID-19 were defined as mild, moderate, and severe. Mild cases had mild clinical symptoms with no signs of pneumonia on CT chest imaging. Moderate cases presented with fever and respiratory symptoms with no signs of pneumonia on CT chest imaging. Severe cases had hypoxia with a respiratory rate of more than 30 breaths per minute, oxygen saturation <93% at rest, the Carrico index, or the ratio of oxygen partial pressure to fractional inspired oxygen (PaO2/FiO2) <300 mmHg.

Statistical analysis
Data so collected was tabulated in an excel sheet, under the guidance of statistician. The means and standard deviations of the measurements per group were used for statistical analysis (SPSS 22.00 for windows; SPSS inc, Chicago, USA). Difference between two groups was determined using student t-test as well as chi square test and the level of significance was set at $p<0.05$.

Results
Out of 200 subjects, 66% were males and 34% were females. Median age of the study subjects was 61 (51-78) years. Maximum subjects belonged to 41-50, 51-60 and >60 years (29%) followed by 51-60 (24%) and 41-50 years (22%) respectively, while the least subjects were having age group of 12-20 years (6%). Smoking and alcohol habits were reported among 31% and 22% of the subjects respectively (table 1).

Table 1: Baseline characteristics among the study subjects

Variable	N=200	%
Gender		
Male	132	66
Female	68	34
Age Group (in years)		
12-20	12	6
21-30	22	11
31-40	16	8
41-50	44	22
51-60	48	24
>60	58	29
Age in years, Median (IQR)	61 (51-78)	
Smoking	62	31
Alcohol	44	22

Obesity, diabetes and hypertension was revealed among 36%, 42% and 59% of the subjects respectively. Coronary artery disease was found among 6% of the subjects. 1% each of the subjects were suffering from hepatitis B as well as hepatitis C respectively (table 2).

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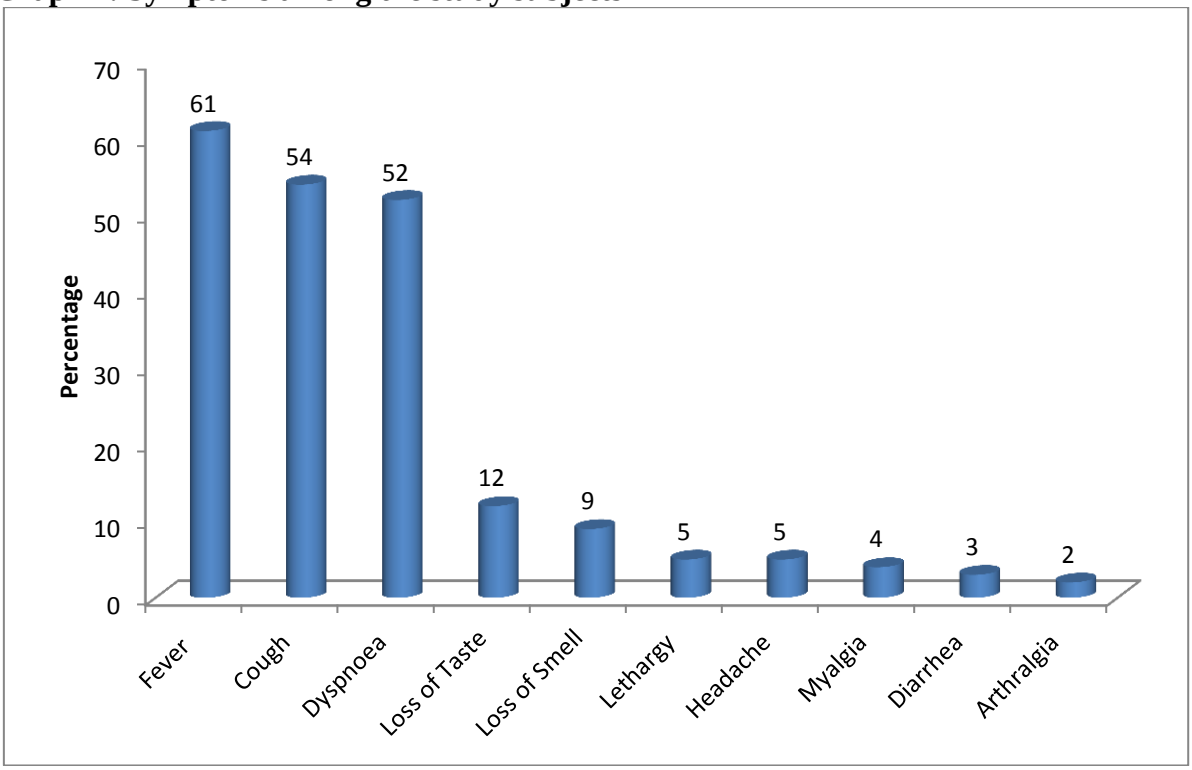
Table 2: Co-morbidities among the study subjects

Co-morbidities	N=200	%
Obesity	72	36
Diabetes	84	42
Cardiovascular Disease		
Hypertension	108	59
Coronary Artery Disease	12	6
Chronic Respiratory Disease		
Asthma	16	8
Chronic Obstructive Pulmonary Disease	12	6
Obstructive Sleep Apnea	4	2
Liver Disease		
Hepatitis B	2	1
Hepatitis C	2	1

Fever, cough, dyspnea, loss of taste, loss of smell, lethargy, headache, myalgia, diarrhea and arthralgia was revealed among 61%, 54%, 52%, 12%, 9%, 5%, 5%, 4%, 3%, 3% and 2% of the subjects respectively (graph 1).

Graph 1: Symptoms among the study subjects



Temperature>38^0 C, oxygen saturation<90%, received supplemental oxygen at triage, respiratory rate>24 breath/min and heart rate>100 beats/min was reported among 61%, 22%, 32%, 18% and 50% of the subjects respectively (graph 2).

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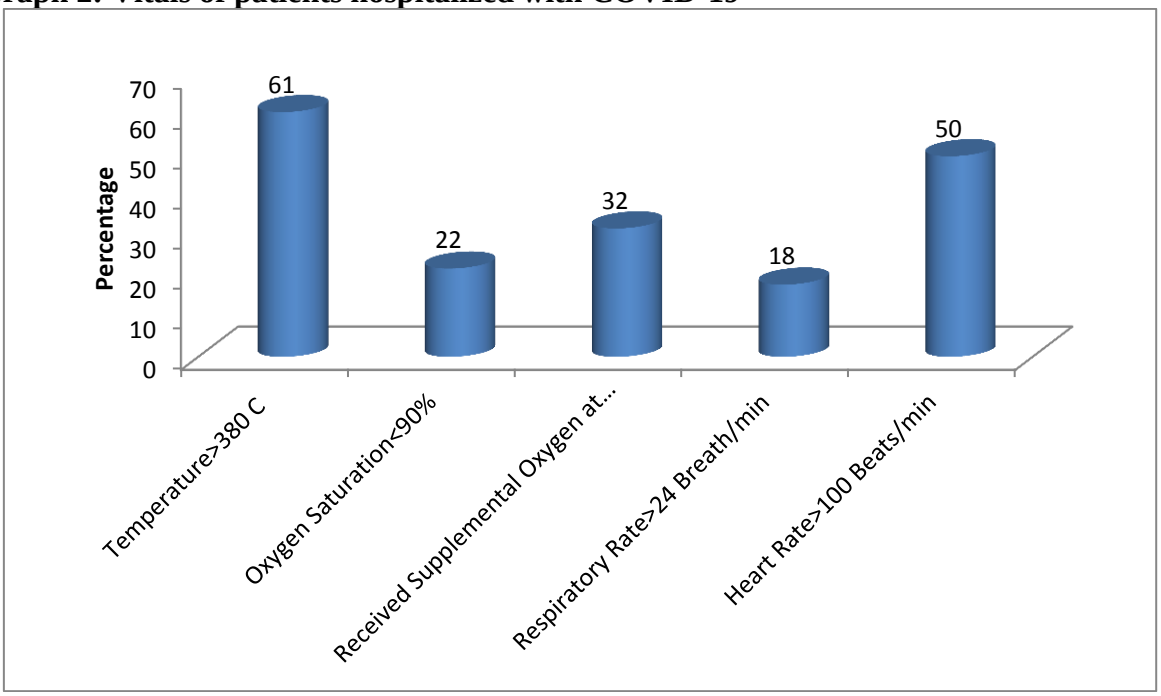
Graph 2: Vitals of patients hospitalized with COVID-19



Mortality was revealed among 13% of the subjects. Mortality due to COVID, co-morbidities and other causes like TB/HIV/MI/COPD was reported among 4%, 6% and 3% of the subjects respectively (table 3).

Table 3: Outcome among the study subjects

Outcome	N	%
Survivor	174	76
Mortality	26	13
Only COVID	8	4
Due to Co-morbidities	12	6
Due to other causes like TB/HIV/MI/COPD	6	3
Total	200	100

Table 4 shows the factors associated with mortality applying univariate analysis. Univariate analysis revealed male sex, age>60 years and history of diabetes was significantly associated with mortality as $p<0.05$. Other factors associated with mortality were smoking, history of heart disease, respiratory disease, liver disease, kidney disease, d-dimer > 1 mg/L and lactate dehydrogenase > 225 U/L, though statistically insignificant.

Table 4: Factors associated with ICU mortality applying univariate analysis

Factor	Univariate	
	OR	p value
Female	Ref	0.27
Male	1.2	
12-20	Ref	
21-30	1.04	0.92
31-40	1.07	0.81
41-60	1.12	0.38
>60	1.97	0.031*
Obesity	1.10	0.54
Smoking	1.48	0.19

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Alcohol	1.16	0.32
History of Hypertension	1.05	0.83
History of Diabetes	1.67	0.041*
History of Heart Disease	1.42	0.18
Respiratory Disease	1.39	0.26
Liver Disease	1.27	0.30
Kidney Disease	1.56	0.09
d-dimer > 1 mg/L	1.40	0.23
Lactate dehydrogenase > 225 U/L	1.41	0.14
C-reactive protein >10 mg/dL	0.89	0.70

*: statistically significant

Discussion

Limited information has been available to describe the presenting characteristics and outcomes of Indian patients requiring hospitalization with this illness. In a retrospective cohort study from China, hospitalized patients were predominantly men with a median age of 56 years; 26% required intensive care unit (ICU) care, and there was a 28% mortality rate[15]. However, there are significant differences between China and the Indian in population demographics[16], smoking rates[17] and prevalence of comorbidities.

In the present study; out of 200 subjects, 66% were males and 34% were females. Median age of the study subjects was 61 (51-78) years. Maximum subjects belonged to 41-50, 51-60 and >60 years (29%) followed by 51-60 (24%) and 41-50 years (22%) respectively, while the least subjects were having age group of 12-20 years (6%). Smoking and alcohol habits were reported among 31% and 22% of the subjects respectively. Vikramjit Mukherjee et al[18], Safiya Richardson et al[19] and Hasani WSR et al[20] in their study revealed similar dominance. In a study by Safiya Richardson et al[19], median age among the study subjects was 63 years. This was similar to our study.

Obesity, diabetes and hypertension was revealed among 36%, 42% and 59% of the subjects respectively. Coronary artery disease was found among 6% of the subjects. 1% and 1% of the subjects were suffering from hepatitis B and hepatitis C respectively in the present study. Due to COVID-19 being a relatively new and understudied disease, the data available is limited. However, from the cases that emerged, it was observed that comorbidities increase the chances of infection. Based on current information and clinical expertise, the elderly, especially those in long-term care facilities, and people of any age with serious underlying medical conditions are at a greater risk of getting COVID-19. The elderly, a vulnerable population, with chronic health conditions such as diabetes and cardiovascular or lung disease are not only at a higher risk of developing severe illness but are also at an increased risk of death if they become ill[21]. People with underlying uncontrolled medical conditions such as diabetes; hypertension; lung, liver, and kidney disease; smokers; and patients taking steroids chronically are at increased risk of COVID-19 infection[22].

In the present study; fever, cough, dyspnea, loss of taste, loss of smell, lethargy, headache, myalgia, diarrhea and arthralgia was revealed among 61%, 54%, 52%, 12%, 9%, 5%, 5%, 4%, 3%, 3% and 2% of the subjects respectively. Hasani WSR et al[20] in their study found that more than one third of symptomatic patients presented with fever (43.8) and cough (37.1%). A meta-analysis study of COVID-19 patients, showed fever (88.8%) as the most common symptom, followed by dry cough (68%) and fatigue (33%). Other symptoms noted were productive cough (28.5%), SOB (17%), muscle pain (14.4%), sore throat (11.4%), and headache (10.2%). The least common symptoms were diarrhea (4.4%), nausea and vomiting (4.1%), rhinorrhea (3.2%), abdominal pain (0.16%), and chest pain (0.11%)[23]. Though the common symptoms were same among the studies, but there is difference in prevalence. This

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might be due to the difference in the study population, area as well as the severity of the patients included in the study.

Mortality was revealed among 13% of the subjects. Mortality due to COVID, co-morbidities and other causes like TB/HIV/MI/COPD was reported among 6%, 4% and 3% of the subjects respectively. Univariate analysis revealed male sex, age>60 years and history of diabetes was significantly associated with mortality as $p<0.05$. Other factors associated with mortality were smoking, history of heart disease, respiratory disease, liver disease, kidney disease, d-dimer>1 mg/L and lactate dehydrogenase > 225 U/L, though statistically insignificant in this study.

Risk factors associated with mortality reported in prior studies include advanced age, male sex, obesity, and other comorbidities, specifically cardiovascular conditions such as hypertension[24-26]. Hasani WSR et al[20] in their study revealed that the most common comorbidities among COVID-19 patients were hypertension (15.5%) and diabetes (11.0%). This was similar to our study. A population-based surveillance report via COVID-19-Associated Hospitalization Surveillance Network (COVID-NET) reported clinical data on 1478 COVID-19-positive patient hospitalizations from March 1 to March 30, 2020. Among the 1478 patients studied, 12% of adults showed clinical data of underlying medical conditions with the most prevalent being hypertension (49.7%) and obesity a close second (48.3%). Other medical conditions included chronic lung disease (34.6%), diabetes mellitus (28.3%), and cardiovascular diseases (27.8%)[27]. This was similar to our study. In a study by Thomas D. Filardoet al[28]; advanced age, male sex, and obesity were the main factors associated with mortality. Cardiovascular and renal comorbidities were not associated with mortality in an adjusted analysis, perhaps owing to a limited sample size and inability to detect these associations. These findings are similar to our study.

Conclusion

COVID-19 patients >=60 years old, who had diabetes, or who presented with fever, dyspnoea, or lethargy, were more likely to be intubated and ventilated. These patients need to be screened for COVID-19 when presented to any healthcare facility and monitored closely by clinicians upon diagnosis and admission. In addition, public health interventions should aim to provide additional protection to older population or people with comorbidity such as diabetes found to be more vulnerable to severe disease progression if infected with COVID-19.

References

1. De Wit E, Van Doremalen N, Falzarano D, Munster VJ. SARS and MERS: recent insights into emerging coronaviruses. Nat Rev Microbiol 2016;523-34.
2. Chen N, Zhou M, Dong X et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China : a descriptive study (published Jan 29, 2020) Lancet.
3. WHO. Coronavirus disease 2019 (COVID-19) Situation Report –90. [cited 2020 October 19]; Available from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200419-sitrep-90-covid-19.pdf?sfvrsn=551d47fd_2
4. Na Zhou. A novel coronavirus from patients with pneumonia in China,2019. N Engl J Med. 2020.
5. Guan W, Ni Z, Hu Y, et al. Clinical characteristics of coronavirus disease 2019 in China. N Engl J Med 2020.
6. Chan JF, Yuan S, Kok KH, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. Lancet. 2020;395(10223):514–23.

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 05, 2022

7. Rodriguez-Morales AJ, Cardona-Ospina JA, Gutierrez-Ocampo E, et al. Clinical, laboratory and imaging features of COVID-19: a systematic review and meta-analysis. Travel Med Infect Dis. 2020;34:101623.
8. Chen N, Zhou M, Dong X, et al. Epidemiological and clinical characteristics of 99 cases of 2019 Novel coronavirus pneumonia in Wuhan, China: a descriptive study. Lancet (London, England). 2020;395(10223):507–13.
9. Zhou F, Yu T, Du R, Fan G, Liu Y, Liu Z, Xiang J, Wang Y, Song B, Gu X. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet. 2020;395(10229):1054–62.
10. Chung M, Bernheim A, Mei X, et al. CT imaging features of 2019 novel coronavirus (2019-nCoV). Radiology. 2020;295(1):202–7.
11. Lei J, Li J, Li X, Qi X. CT imaging of the 2019 novel coronavirus (2019-nCoV) pneumonia. Radiology. 2020;295(1):18.
12. Cheng ZJ, Shan J. Novel coronavirus: where we are and what we know. Infection. 2019;2020:1–9.
13. Liu WJ, Zhao M, Liu K, Xu K, Wong G, Tan W, Gao GF. T-cell immunity of SARS-CoV: implications for vaccine development against MERS-CoV. Antiviral. 2017;137:82–92.
14. Wang C, Horby PW, Hayden FG, Gao GFJTL. A novel coronavirus outbreak of global health concern. Lancet. 2020;395(10223):470–3.
15. Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet. 2020;395(10229):1054-1062.
16. United Nations Department of Economic and Social Affairs Population Dynamics. World population prospects 2019. Accessed April 6, 2020. https://population.un.org/wpp/Graphs/DemographicProfiles/Pyramid/840.
17. Chen Z, Peto R, Zhou M, et al; China KadoorieBiobank (CKB) collaborative group. Contrasting male and female trends in tobacco-attributed mortality in China: evidence from successive nationwide prospective cohort studies. Lancet. 2015;386(10002):1447-1456.
18. Mukherjee V, Toth AT, Fenianos M, et al. Clinical outcomes in critically ill coronavirus disease 2019 patients: a unique New York city public hospital experience. Critical Care Explorat. 2020;2(8).
19. Richardson S, Hirsch JS, Narasimhan M, et al. Presenting characteristics, comorbidities, and outcomes among 5700 patients hospitalized with COVID-19 in the New York City area. JAMA. 2020;323(20):2052-9.
20. Hasani WS, Ganapathy SS, Zhuo C, Lin HM, Bahari MN, Ghazali MH. Comorbidities and clinical features related to Invasive Ventilatory. J Am Heart Assoc. 2020;9(7):e016509.
21. BCCDC. COVID-19 vulnerable populations. British Columbia Centre for Disease Control 2020. [Accessed April 18, 2021, http://www.bccdc.ca/health-info/diseases-conditions/covid-19/ vulnerable-populations].
22. CDC. Coronavirus (COVID-19): symptoms of coronavirus. Centers for Disease Control andPrevention.2020.[AccessedApril18,2021,https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html].
23. Paudel SS. A meta-analysis of 2019 novel coronavirus patient clinical characteristics and comorbidities. Research Square. 2020.
24. Argenziano MG, Bruce SL, Slater CL, Tiao JR, Baldwin MR, Barr RG, et al. Characterization and clinical course of 1000 patients with coronavirus disease 2019 in New York: retrospective case series. BMJ.2020; 369:m1996.

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25. Docherty AB, Harrison EM, Green CA, Hardwick HE, Pius R, Norman L, et al. Features of 20 133 UK patients in hospital with covid-19 using the ISARIC WHO Clinical Characterisation Protocol: Prospective observational cohort study. BMJ. 2020; 369:m1985.
26. Gupta S, Hayek S, Wang W, Chan L, Mathews K, Melamed M et al. Factors associated with death in critically ill patients with coronavirus disease 2019 in the US. JAMA Int Med. 2020 Jul 15;e203596.
27. Garg S, Kim L, Whitaker M, et al. Hospitalization rates and characteristics of patients hospitalized with laboratory-confirmed coronavirus disease 2019 — COVID-NET, 14 states, March 1–30, 2020. Centers for Disease Control and Prevention: MMWR. 2020;69(15):458–64.
28. Filardo TD, Khan MR, et al. Comorbidity and clinical factors associated with COVID-19 critical illness and mortality at a large public hospital in New York City in the early phase of the pandemic (March-April 2020). PloS one. 2020;15(11):e0242760.