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Research Article

Clinical Characteristics of 82 Cases of COVID-19 Patients in Wuhan, China

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ABSTRACT

Background: COVID-19 has become a global public health emergency. Currently, COVID-19 is still widespread in some countries. We report the epidemiological, clinical, laboratory, radiological characteristics, treatment and clinical outcomes of 82 cases of COVID-19 patients.

Methods: The electronic medical records of 82 COVID-19 hospitalized patients with confirmed SARS-CoV-2 virus infection were extracted and analyzed in detail.

Results: The median age of those patients was 61 years; 58.5% of the patients were male. The primary composite end point occurred in 63 patients (76.8%), including 3.2% who died and the rest recovered. Fever (67.1%), cough (78.1%), fatigue (50.0%), cough with phlegm (36.6%), and muscle soreness (31.7%) were the most common clinical symptoms, whereas hypertension (31.7%), heart disease(12.2%) and diabetes mellitus (7.3%) were the most common comorbidities. Ground-glass opacity was present in 71 (86.6%) patients. Lymphopenia (61.7%) and procalcitonin (65.4%), C-reactive protein (86.3%) increased were observed in most patients.

Conclusion: COVID-19 patients sometimes free of fever and cough, and many had no abnormal radiologic findings. A clinical investigation of 82 COVID-19 patients suggested that lymphopenia and procalcitonin, C-reactive protein increased may be a potential indicator for diagnosis.

Keywords: COVID-19; SARS-CoV-2; Clinical characteristics; Diagnosis; Fatty liver; Obesity; Fam20 C (Family with sequence similarity 20C)

INTRODUCTION

The Coronavirus Disease 2019 (COVID-19) has become a global public health emergency since patients were first detected in December 2019 [1]. It is mainly characterized by fever, cough, shortness of breath and dyspnea [2]. SARS-CoV-2 can survive for long periods of time at room temperature, resulting in a high level of infectiousness. The main routes of transmission of SARS-CoV-2 are respiratory droplet transmission and contact transmission, while aerosol and fecal-oral routes of transmission have yet to be clarified [3]. People of all ages can be infected, and it is mainly adults who are infected, with the elderly and the infirm seemingly more susceptible [4]. In more severe cases, the infection can lead to pneumonia, severe acute respiratory syndrome, renal failure and even death [5]. People in many countries do not have health insurance, they do not have enough money to pay for medical care, and when they fall ill they are left to fend for themselves, seriously affecting the stability of society. Currently, COVID-19 is still widespread in some countries. In China, there have been a small number of new confirmed cases in some areas since the beginning of autumn. Many experts in China and abroad suggest that COVID-19 may break out again in the winter of 2020, and COVID-19 may coexist with humans for as long as the influenza virus. But so far, we don't know much about COVID-19 and SARS-CoV-2, and there is no specific treatment for the disease caused by SARS-CoV-2. We can only treat the symptoms, not kill the SARS-CoV-2 virus directly. At this time, it is especially important to cut off the transmission of the disease, and we advocate the continued practice of wearing masks, as well as advising attention to hand hygiene.

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Recently, some clinical researches suggested that massive inflammatory cell infiltration and inflammatory cytokines secretion were found in COVID-19 patients' lungs, alveolar epithelial cells and capillary endothelial cells were damaged, causing acute lung injury [1,6]. Many studies have shown that SARS-CoV-2 induces disease through its spike protein specifically recognizes the angiotensin I converting enzyme 2 receptor (ACE 2) [6,7]. The main organ injured by SARS-CoV-2 is the lung. Actually, ACE 2 is widely present in many organ and tissues [8]. COVID-19 can also affect the nervous, digestive, urinary, blood and other systems [2,9].

Therefore, when early symptoms are other systemic disorders, it is often easy to misdiagnose and delay treatment, and eventually developing into a serious disease which hard to cure. Therefore, understanding the detailed clinical symptoms and characteristics of COVID-19 is important for the prevention and treatment of the disease. Therefore, we collated the electronic medical records of 82 COVID-19 cases from our hospital to describe the epidemiological, clinical, laboratory, and radiological characteristics, treatment, and outcomes of these patients. We hope to contribute to the research on COVID-19, and hope that the world can work together to defeat SARS-CoV-2 as soon as possible.

MATERIALS AND METHODS

Patients' involvement and data collection

This study was approved by Puren Hospital Affiliated to Wuhan University of Science and Technology ethics committee (Number: 2020-001), and that the guidelines outlined in the Declaration of Helsinki were followed. All hospitalized patients (admission date from January 17 to February 25, 2020) in Puren Hospital Affiliated to Wuhan University of Science and Technology, clinically diagnosed as "viral pneumonia", were preliminarily involved in this study. Swab samples from patients were collected for nucleic acid testing of SARS-CoV-2 virus. 82 patients with positive nucleic acids were finally included in the study. The results of each of the 82 COVID-19 patients' examinations were obtained from the electronic medical record system and were counted and analyzed by personnel not involved in the study.

The severity of COVID-19 was recorded. In compliance with the 2019-nCoV pneumonia diagnosis standard (according to the novel coronavirus infection pneumonia diagnosis and treatment program (Trial Implementation Version 6) issued by the National Health and Medical Commission) [2]. When one of these criteria is met, a patient with severe COVID-19 is diagnosed: (A) increased breathing rate (≥ 30 beats/min), difficulty breathing, cyanosis of the lips; (B) in resting state, means oxygen saturation ≤ 93%; (C) partial pressure of arterial oxygen (PaO2)/Fraction of inspired oxygen (FiO2) ≤ 300 mmHg (1 mmHg=0.133 kPa) [2].

Laboratory testing

Pharyngeal swab specimens of patients were collected for the detection of SARS-CoV-2 virus nucleic acid by RT-PCR. All patients' viral nucleic acid tests were performed by the Molecular Laboratory from Puren Hospital Affiliated to Wuhan University of Science and Technology. Primer sequences and amplification conditions were performed according to the literature [2]. Initial investigations include complete blood counts, blood gas analysis, serum biochemistry tests and other indicators.

Statistical analysis

Categorical variables were summarized as percentages, and continuous variables were described using median and interquartile ranges (IQR) values. All graphs were plotted using Graph Pad Prism 7.00.

MATERIALS AND METHODS

Demographics and clinical characteristics

Between January 17, 2020 and February 25, 2020, 82 patients with SARS-CoV-2 infection were treated at our hospital. 16 (19.5%) of the SARS-CoV-2 infected patients were aged 20–45 years, 21 (25.6%) were aged 45–60 years, and 45 (54.9%) were aged 60–87 years, shown in Table 1. The median age of the patients was 61 years old (IQR 20–87; Table 1). No children or adolescents were infected. In the present study, 13 (15.9%) family members or friends of COVID-19 patients were also infected with SARS-CoV-2. One hospital staff member was infected. 55 (67.1%) patients had at least one underlying co-morbidity, the more common of which were hypertension (31.7%), heart disease (12.2%) and diabetes (7.3%). 6 patients had a history of drug allergy, types of drugs included penicillin, cephalosporin, sulfonamide, alcohol. 11 (13.4%) patients had surgical experience, such as cesarean section, nasal surgery, and cholecystectomy.

Table 1: Demographics and baseline characteristics of patients with COVID-19.

	All patients (n=82)
Age-median (range)	61 (20-87)
Age-groups-No. (%)	
≤ 30 y	5 (6.1)
30-45 y	11 (13.4)
45-60 y	21 (25.6)
>60 y	45 (54.9)
Sex-No. (%)	
Female	34 (41.5)
Male	48 (58.5)
Exposure history-No. (%)	
Familiar/cluster infections	13 (15.9)
Hospital staff	1 (1.2)
Comorbidity-No. (%)	55 (67.1)
Hypertension	26 (31.7)
Diabetes	6 (7.3)
Heart disease	10 (12.2)
Stroke	5 (6.1)
Chronic renal insufficiency	5 (6.1)
Viral hepatitis type B	3 (3.7)
Gastritis	1 (1.2)
Chronic bronchitis	1 (1.2)
Drug hypersensitivity-No. (%)	6 (7.3)
Penicillin and cephalosporin allergy	3 (3.7)

Sulfonamide allergy	2 (2.4)
Alcohol allergy	1 (1.2)
Surgery history-No. (%)	11 (13.4)
Cesarean section-No./total female No. (%)	6/34 (17.6)
Hysterectomy-No./total female No. (%)	1/34 (2.9)
Nose surgery	3 (3.7)
Cholecystectomy	1 (1.2)

Patients' symptoms on admission were shown in Table 2. The median interval from symptom onset to hospitalization for 82 patients was 7 days (IQR, 1-30). The most common symptom was cough (78.1%), followed by fever (67.1%), fatigue (50.0%), cough with phlegm (36.6%), muscle soreness (31.7%) and chest tightness or dyspnea (25.6%).

Table 2: Symptomatic and radiological characteristics of patients with COVID-19.

	All patients (n=82)
Onset of symptom to hospital	1 (1.2)
admission-median (IQR), days	7 (1-30)
Signs and symptoms-No. (%)	
Cough	64 (78.1)
Fever	55 (67.1)
Fatigue	41 (50.0)
Cough with phlegm	30 (36.6)
Muscle soreness	26 (31.7)
Chest tightness/dyspnea	21 (25.6)
Panting	15 (18.3)
Dizziness	11 (13.4)
Increased heart rate	11 (13.4)
Increased breath rate	9 (11.0)
Nausea and vomiting	8 (9.8)
Diarrhea	6 (7.3)
Tachypnea	4 (4.9)
Chest pain	2 (2.4)
Chest CT images-No. (%)	
Ground-glass opacity	71 (86.6)
Bilateral lung	62 (75.6)
Single lung-left	4 (4.9)
Single lung-right	5 (6.1)
Normal	11 (13.4)

Radiological and laboratory test results

Of these patients who had chest CT scans on admission, the majority (71, 86.6%) had abnormal findings, showing the typical image of bilateral ground-glass opacities or consolidation (Table 2). Interestingly, 61.7% of these patients had lymphocytopenia (Figure 1). The concentrations of C-reactive protein (86.3%) and procalcitonin (65.4%) were significantly higher shown in Figure 1.

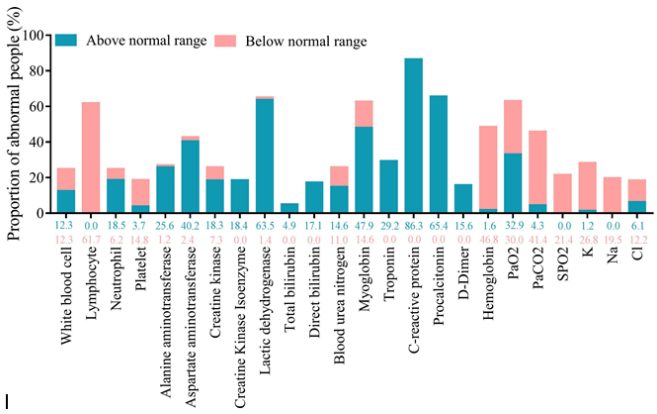

Figure 1: Laboratory findings of patients with COVID-19 on admission to hospital.

Treatment and outcome

A majority of the patients (91.5%) received intravenous antibiotic therapy, antiviral therapy (93.9%), using of corticosteroid (87.8%), a few patients did human immunoglobulin (8.5%) and human albumin (2.4%); oxygen therapy was administered in 56.1% and nasal cannula in 37.8%, shown in Table 3. 19 patients were lost as new crown patients were transferred to designated hospitals. Of the remaining 63 patients, 61 recovered and were discharged and 2 patients died.

Table 3: Treatments and outcomes of patients with COVID-19.

	Patients-No./Total No. (%)
Treatment	
Antiviral therapy	77/82 (93.9)
Antibiotic therapy	75/82 (91.5)
Use of corticosteroid	72/82 (87.8)
Human Immunoglobulin	7/82 (8.5)
Human Albumin	2/82 (2.4)
Oxygen support	
Nasal cannula	31/82 (37.8)
Non-invasive ventilation	7/82 (8.5)
Mask oxygen	8/82 (9.8)
Prognosis	
Recovery	61/63 (96.8)
Death	2/63 (3.2)

DISCUSSION

This study included 82 patients with COVID-19, and we found that 80.5% of the patients were over 45 years of age, and 58.5% of them were male. The age range of the patients was 20-87 years, with a median age of 61 years, which is higher than the other reported ages [10,11]. This may be due to the aging of the population in The Qingshan district of Wuhan. In our report, 55 (67.1%) patients had comorbidities and (13.4%) had a history of surgery. Consistent with other recent reports, we found that hypertension (31.7%), diabetes (7.3%), and cardiovascular disease were the most common underlying diseases [12-14]. The prevalence of hypertension in adults was 23.2% in China [15-17], and the prevalence of hypertension in our study was 31.7%; this may be due to the generally older age of

COVID-19 patients. Overall, people over the age of 45 are more likely to be infected with COVID-19, possibly due to more health problems and comorbidities in this population.

Cough (78.1%), fever (67.1%), and fatigue (50.0%) were the most common symptoms in patients with COVID-19. Patients with COVID-19 had other clinical symptoms such as cough with phlegm (36.6%), muscle soreness (31.7%) and chest tightness or dyspnea (25.6%). CT showed bilateral ground-glass and patchy opacity in 86.6% patients.

Similar clinical features had been noted between SARS-CoV-2 and previous beta coronavirus infections. In this cohort, most patients presented with fever, cough, fatigue, and bilateral ground-glass opacities on chest CT scans. These features of SARS-CoV-2 infection share some similarities with SARS-CoV and MERS-CoV infections [18-20]. However, very few patients with SARS-CoV-2 infection had significant upper respiratory signs and symptoms (e.g., sneezing, or sore throat), suggesting that the target cells may be located in the lower airways. In addition, SARS-CoV-2 patients rarely present with gastrointestinal signs and symptoms (e.g., diarrhea), whereas approximately 20%-25% of patients with MERS-CoV or SARS-CoV infection present with diarrhea [21-25].

CONCLUSION

Lymphopenia was present in 61.7% of patients, which is consistent with other reports. Serum procalcitonin, C-reactive protein, D-dimer, and creatine Kinase Isoenzyme levels were elevated, suggesting a persistent inflammatory response and disturbance of the coagulation mechanism after SARS-CoV-2 infection. More attention should be paid to patients with high serum creatine Kinase Isoenzyme, which may be due to the direct action of the virus or the indirect action of hypoxia. 19 patients were lost due to transfer of the new crown to the designated hospital. Of the remaining 63 patients, 61 were cured and discharged and 2 died. More severe cases, the SARS-Cov-2 infection can lead to pneumonia, severe acute respiratory syndrome, renal failure and even death. But so far, we don't know much about COVID-19 and SARS-CoV-2, and there is no specific treatment for the disease caused by SARS-CoV-2. We can only treat the symptoms, not kill the SARS-CoV-2 virus directly. However, many of the symptoms are manageable and therefore need to be treated according to the patient's clinical condition. In addition, supportive care of the infected person may be very effective. At this time, it is especially important to cut off the transmission of this disease, and we advocate continuing the practice of wearing masks. Self-protection includes maintaining basic hand and respiratory hygiene, adhering to a safe diet, and avoiding close contact with anyone who exhibits symptoms of respiratory illness, such as coughing and sneezing, whenever possible. In summary, this study included 82 patients with COVID-19, and we found that 80.5% of the patients were over 45 years of age, and 58.5% of them were male. Patients sometimes presented without fever and cough, and many did not have abnormal radiologic findings. Lymphopenia and procalcitonin, C-reactive protein increased may be useful indicators for the diagnosis of COVID-19 in patients who do not have typical symptoms and radiographic changes. Due to the small sample size, our study has some limitations. A larger population sample is needed to further investigate the relationship between SARS-CoV-2 infection and allergic diseases.

AUTHOR'S CONTRIBUTION

YZ, KL and JZ: Data curation, Formal analysis, Investigation, Methodology, Validation, Writing and revising manuscript; SHX and XL: Data curation, Investigation, Methodology, Resources, Validation, Revising manuscript; YXL: Conceptualization, Formal analysis, Supervision, Revising manuscript; YYD and YL: Conceptualization, Data curation, Formal analysis, Project administration, Resources, Supervision, Revising manuscript. All authors read and approved the final manuscript, and agreed to take responsibility for the contents of the article.

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DATA AVAILABILITY

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

COMPETING INTERESTS

The authors report no conflicts of interest in this work.

CONSENT FOR PUBLICATION

Written informed consent was obtained from the patient for publication.

ACKNOWLEDGMENTS

Not applicable.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This clinical study was a retrospective study, which only collected clinical data of patients, did not interfere with the treatment plan of the patients, and would not bring risks to the patients. We did our best to protect the information provided by the patients from leaking personal privacy. Informed consent was confirmed by the participant. This study was approved by Puren Hospital Affiliated to Wuhan University of Science and Technology ethics committee (Number: 2020-001), and that the guidelines outlined in the Declaration of Helsinki were followed.

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