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Coronavirus Pandemic

Clinical Characteristics of 33 Asymptomatic COVID-19 Infections in Wuhan, China

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Abstract

Clinical characteristics of 33 asymptomatic COVID-19 infections were analyzed in this study. The data showed most of asymptomatic patients had small body mass index, good prognosis and low infectivity. This study suggests that screening from high-risk populations to find and isolate asymptomatic patients is an important disease prevention and control strategy for COVID-19.

Key words: Clinical characteristics; COVID-19; asymptomatic.

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Introduction

Coronavirus disease 2019 (COVID-19) outbreak has raised serious international concerns [1, 2]. By June 3, 2020, there are more than six million confirmed cases of the COVID-19 and more than 300 thousand deaths globally [3]. So far, there are no specific treatments or vaccines to this disease [4-6]. Currently, with the large-scale, high-intensity screening approaches, symptomatic patients are being quickly diagnosed, while more and more asymptomatic cases are identified [7]. However, the clinical features and infectivity of asymptomatic carriers remain an urgent public health issue. According to the epidemiology report from Chinese Center for Disease Control and Prevention, there were 889 asymptomatic COVID-19 infected patients among 44,672 laboratory-confirmed cases, accounting for 2.0% of the total confirmed cases [8]. Therefore, it is critically important to know about features of asymptomatic COVID-19 patients to guide screening strategies. We reported the clinical features of 33 retrospectively collected asymptomatic patients with confirmed COVID-19 infection from Wuhan, a most seriously infected city of China.

Methodology

For this study, we retrospectively reviewed the medical records of patients diagnosed with COVID-19 infection between 21 January and 5 March 2020, in Zhongnan Hospital of Wuhan University. Finally, 33 asymptomatic patients were identified, and all involved patients were confirmed by real-time polymerase chain reaction (RT-PCR) test. We collected the following information from the medical records, accompanied with interview with the patients: the demographic information, including age, gender, body mass index (BMI), family clustering, clinical features (computed tomography [CT] scan, dates of CT, symptoms, diagnosis, date of diagnosis, admission and discharge, treatment and prognosis). The last follow-up time was 15 March 2020. This study was approved by the institutional review board of Zhongnan Hospital of Wuhan University (No. 2020035). Informed consent was waived as part of a public health outbreak investigation.

Results

We collected 33 asymptomatic COVID-19 infected patients in Zhongnan Hospital of Wuhan University, and 19 patients (57.6%) of these patients were female. All patients had an exposure history and a direct linkage to Wuhan. Their median age was 36 years old (range: 7-93). There were seven patients (21.2%) older than 60 years of age. Before 18 February, only one infected patient was older than 50 years. The median age of patients' cohorts diagnosed before 18 February were younger than it after 18 February (36 years, range: 7-64

years vs 53 years, range: 10-93 years, p = 0.111). Almost all adults (26/27, 96.3%) have BMI lower than 25. And 24 patients (72.7%) had no accompanying chronic disease. Detailed information of those 33 asymptomatic COVID-19 patients was shown in Supplementary Table 1.

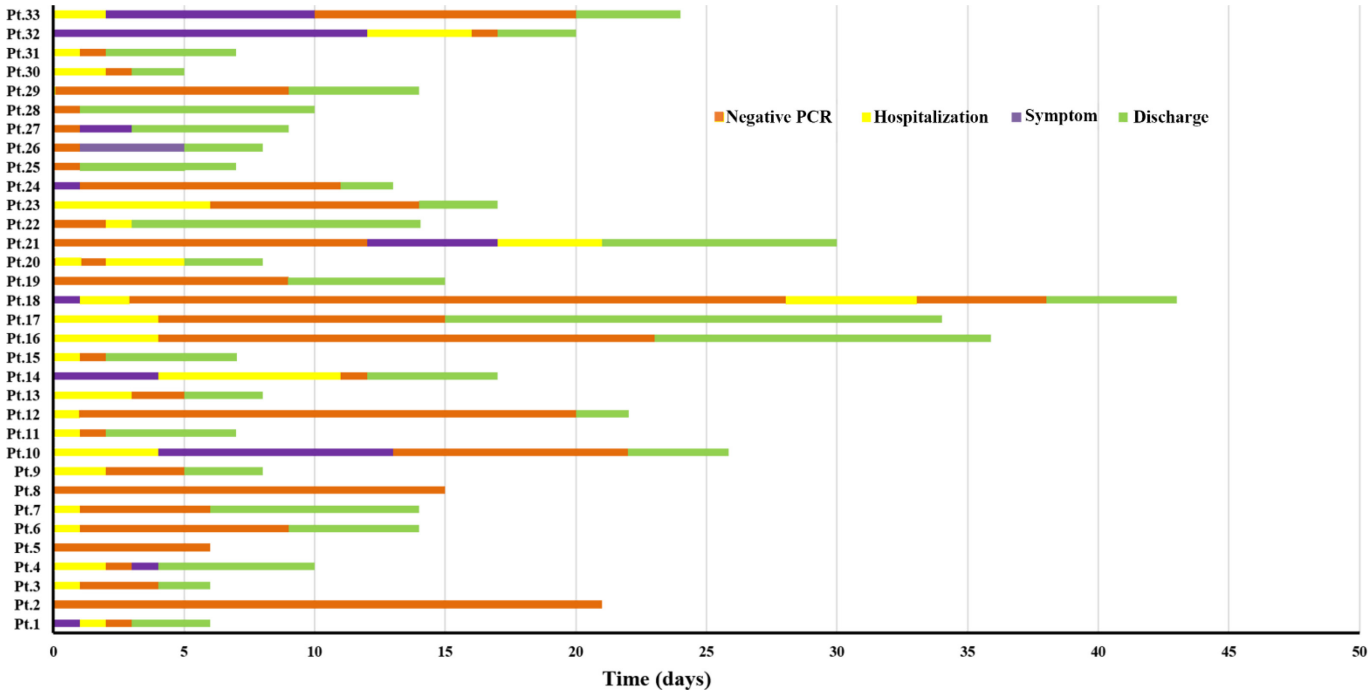
Timeline of the course of 33 asymptomatic COVID-19 patients was displayed in Figure 1. And 17 patients (51.5%) showed no abnormality of CT scan, 14 patients (42.4%) had mild form of CT manifestation as the starting phenomenon (focal patchy ground glass opacities around the peripheral parts of the lungs on CT scans, which were compatible with changes seen in viral pneumonia). Patient 28 rejected for CT examination. Twenty-three patients (69.7%) were asymptomatic throughout the follow-up time and ten patients (30.3%) had mild symptoms after diagnosis. Thirteen patients (39.4%) were negative for any radiological changes or symptoms during follow-up. Only one old patient (Pt. 24) was severe for CT scan and clinical classification. No one died from COVID-19. Different from European report [9], no patients with temporary anosmia or ageusia were found in this study. It may indicate the incidences of anosmia and/or ageusia for asymptomatic patients were very low. Thirty patients (90.9%) were isolated and treated in hospital. The rest of patients (3/33, 9.1%) were isolated and observed at homes. A total of 28 patients (84.8%) received antiviral medications (including abidor, darunavir and cobicistat, oseltamivir, lopinavir and ritonavir, interferon). Only one patient used immunoglobulin, and no one used glucocorticoid. Up to 15 March, all patients had negative virus nucleic acid tests for two consecutive times and discharged from hospital. The median time from diagnosis to two consecutive negative viral conversions was 6 days (range 1 to 28 days). Two patients (Pt. 7 is the child of Pt. 6) had family clustering history (husband of Pt. 6 was diagnosed as symptomatic patient earlier).

Remarkably, we followed close contacts of those patients and found that only Pt. 22 had definitely infectivity (Pt. 22 infected his wife, and his wife was also an asymptomatic patient who not collected in this study). Up to 15 March, no close contacts were infected for 17 patients, and infectivity of other 15 patients could not confirmed because their family members were infected before.

Discussion

More and more asymptomatic COVID-19 patients were reported in China [7, 8]. Our retrospective report involving 33 asymptomatic patients showed that these

Figure 1. Timeline of the course of 33 asymptomatic COVID-19 patients.



Day 0: the time point diagnosed by real-time polymerase chain reaction test; the tail end of the color timeline is the beginning of disease courses; the end point of the green line represents the time from nucleic acid positive to discharge from hospital; Pt. 3, Pt. 5, Pt. 8 are isolated at home; Pt. 19 and Pt. 29 are viral nucleic acid positive during hospitalization for other diseases; Pt. 24, Pt. 25, Pt 26, Pt 27, Pt 28 and Pt. 29 are admitted into hospital on the day of viral nucleic acid positive.

patients had clear exposure history to COVID-19. Less than half (45.5%) of these asymptomatic patients had mild changes in CT scan at diagnosis. Only one old patient develop severity, but cured finally. It reported that ACE2 receptor was high expression in fat tissues [10] and fat people showed poor prognosis for influenza virus infection [11]. This report showed 26/27 asymptomatic adults had BMI < 25. It indicates COVID-19 patients with low BMI may have mild disease course. In addition, 24 patients (72.7%) had no accompanying chronic disease. Those results may explain why the patients have good prognosis. Interestingly, we observed the tendency of age at the early period of epidemic situation was younger than the later period. May it imply the virus is becoming less virulent with the outbreak progresses? It had reported that familial cluster was frequently in pneumonia associated with COVID-19 [12]. Notably, only one family member was infected by these asymptomatic patients in our study. Patient 22 infected his wife, and his wife was also an asymptomatic patient. This may indicate asymptomatic patients still have infectivity. And, initiating screening from high-risk populations to find and isolate asymptomatic infected patients may contribute to protect close contacts from infection. Therefore, considering the crisis in Hubei province and worldwide, it is highly recommended that people who have an exposure history should be monitored or screened, even for people without any symptoms. There were some limitations in our study. Firstly, the number of cases we identified was small. So, we need to be cautious to extend our findings. Secondly, the patients in our study were collected from a COVID-19 designated hospital. It may not reflect all asymptomatic patients. Therefore, we still need more cases to show the infection characteristics for this group of patients. This is of vital importance for making our future prevention strategies.

Conclusion

The results show that asymptomatic COVID-19 patients have small body mass index and good prognosis, but still have a low infectivity. This suggests that initiating screening from high-risk populations to find and isolate asymptomatic infected patients is an important disease prevention and control strategy for COVID-19.

Authors' Contribution

YY Chen, Wang had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Concept and design: YY Chen, Wang, Zheng. Acquisition, analysis, or interpretation of data: YY Chen, Zheng, Wang. Drafting of the manuscript: YY Chen. Critical revision of the manuscript for important intellectual content: Zheng, XP Chen, Wang. Statistical analysis: YY Chen, Wang. Obtained funding: N/A. Administrative, technical, or material support: Zheng, Wang. Supervision: Wang, Zheng. Funding/Support: N/A.

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Conflict of interests: No conflict of interests is declared.

Annex – Supplementary Items

Supplementary Table 1. Characteristics of 33 asymptomatic patients infected with coronavirus disease 2019.

Pt	Age	Gender	BMI	Combined diseases	Symptoms		CT signs	Time (days)					Hospitalization	Treatment
					At onset	After onset		CT to diagnosis	Diagnosis to symptoms	CT to symptoms	Diagnosis to RT-PCR negative	Hospital stay		
1	26	M	< 25	No	No	No	No	1	No	No	2	4	Yes	Antivirus (abidor, darunavir and cobicistat)
2	35	M	< 25	No	No	No	Mild	1	No	No	21	NA	No	Antivirus (abidor)
3	39	F	< 25	No	No	No	No	1	No	No	4	5	Yes	Antivirus (abidor, darunavir and cobicistat)
4	35	F	< 25	No	No	Chest distress; Muscle ache	Mild	0	4	4	3	8	Yes	Antivirus (oseltamivir), antibiotics (moxifloxacin)
5	48	M	< 25	No	No	No	Mild	7	No	No	6	NA	No	Antivirus (abidor, lopinavir and ritonavir), antibiotics (moxifloxacin)
6[1]	37	F	< 25	No	No	No	No	1	No	No	9	13	Yes	Antivirus (abidor, darunavir and cobicistat)
7	7	F	< 25	No	No	No	No	1	No	No	6	13	Yes	No
8	36	M	< 25	Tuberculosis	No	No	Mild	4	No	No	15	NA	No	Antivirus (abidor)
9	14	M	< 25	No	No	No	No	0	No	No	5	6	Yes	Antivirus (abidor, interferon)
10	13	M	ND	No	No	Cough	Mild	5	13	8	22	22	Yes	Antivirus (abidor, interferon)
11	12	F	ND	No	No	No	Mild	3	No	No	2	6	Yes	Antivirus (abidor, interferon)
12	10	F	ND	No	No	No	No	2	No	No	20	21	Yes	Antivirus (abidor, interferon)
13	9	M	ND	No	No	No	No	0	No	No	5	5	Yes	Antivirus (abidor, interferon)
14	36	F	< 25	Arrhythmia	No	Flustered	Mild	1	5	4	13	13	Yes	Antivirus (abidor)
15	33	M	< 25	No	No	No	No	0	No	No	2	6	Yes	No
16	44	F	< 25	No	No	No	Mild	0	No	No	23	32	Yes	Antivirus (abidor, lopinavir and ritonavir), antibiotics (moxifloxacin)
17	43	F	< 25	Cancer	No	No	Mild	0	No	No	15	11	Yes	Antivirus (abidor, interferon)
18	44	M	< 25	Hypertension	No	Fever	No	20	1	19	28	7	Yes	Antivirus (abidor), antibiotics (moxifloxacin)
19	34	F	< 25	No	No	No	Mild	1	No	No	9	15	Yes	Antivirus (abidor), antibiotics (moxifloxacin)
20	25	M	> 25	No	No	No	No	0	No	No	2	3	Yes	Antibiotics (moxifloxacin)
21	29	F	< 25	No	No	Chest tightness, dizziness, fatigue	No	1	17	18	12	9	Yes	Antivirus (abidor), antibiotics (moxifloxacin)

Supplementary Table 1 (continued). Characteristics of 33 asymptomatic patients infected with coronavirus disease 2019.

Pt	Age	Gender	BMI	Combined diseases	Symptoms		CT signs	Time (days)					Hospitalization	Treatment
					At onset	After onset		CT to diagnosis	Diagnosis to symptoms	CT to symptoms	Diagnosis to RT-PCR negative	Hospital stay		
22[2]	72	M	< 25	No	No	No	Mild	1	No	No	2	14	Yes	Antivirus (abidor), antibiotics (moxifloxacin)
23	53	M	< 25	No	No	No	No	3	No	No	14	17	Yes	Antivirus (darunavir and cobicistat), antibiotics (moxifloxacin)
24	89	F	< 25	Hypertension	No	Fatigue	Severe	2	1	1	11	13	Yes	Antivirus (abidor), antibiotics (moxifloxacin), immune globulin
25	93	F	< 25	Hypertension, coronary heart disease	No	No	Mild	2	No	No	1	7	Yes	Antivirus (abidor, darunavir and cobicistat)
26	83	F	< 25	Hypertension	No	Cough	No	1	5	4	1	8	Yes	Antivirus (abidor, darunavir and cobicistat)
27	83	F	< 25	Hypertension	No	Cough	No	4	3	1	1	9	Yes	Antivirus (abidor, darunavir and cobicistat)
28[3]	92	F	< 25	No	No	No	NA	NA	No	No	1	10	Yes	Antivirus (abidor, darunavir and cobicistat)
29	59	M	< 25	Hypertension	No	No	No	9	No	No	9	6	Yes	Antivirus (abidor, oseltamivir)
30	41	F	< 25	No	No	No	No	0	No	No	3	3	Yes	No
31	25	M	< 25	No	No	No	No	7	No	No	2	6	Yes	Antibiotics (moxifloxacin)
32	64	F	< 25	No	No	Dizzy, eyes swelling	Mild	1	12	13	17	6	Yes	Antivirus (abidor)
33	36	F	< 25	No	No	Cough	Mild	4	10	14	20	7	Yes	Antivirus (abidor)

Pt: patient; BMI: Body Mass Index; NA: not available; ND: not done; CT: computed tomography; RT-PCR: real-time polymerase chain reaction. [1] Pt. 6 is the mother of Pt. 7, Pt. 6 husband was a symptomatically infected patients diagnosed before. [2] Pt 22 infected his wife. [3] Pt 28 rejected CT examination.