Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: Chen L, Li Q, Zheng D, et al. Clinical characteristics of pregnant women with Covid-19 in Wuhan, China. N Engl J Med. DOI: 10.1056/NEJMc2009226

Clinical characteristics of pregnant women infected with Coronavirus Disease 2019 in Wuhan, China

Supplementary Appendix

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Method

Data collection

During the outbreak of Covid-19, all patients with covid-19 were admitted in 50 designated hospitals in Wuhan. Medical records of them were uploaded by the designated hospitals through the epidemic reporting system of the National Health Commission of the People's Republic China. The data were sent to the data-processing center in Beijing and updated each day. Under the coordination of the National Health Commission of the PRC, we extracted information regarding epidemiological, clinical, laboratory and radiological characteristics, treatment and outcomes with customized data collection forms. Two researchers (LC and QL) reviewed the data collection forms independently to check data reliability. The data cutoff for the study was from December 8, 2019 to March 20, 2020. We identified 118 pregnant women with Covid-19 and analyzed their disease spectrum in the present study. We collected the number of the total Covid-19 patients during the study period from the Wuhan Municipal Health Commission, and then calculated the constituent ratio of pregnant patients. We also acquired the number of delivered pregnant women in Wuhan city during the study period from the Maternal and Child Health system of Hubei Province, and then calculated the incidence of Covid-19 among deliveries.

Study definition

According to the criterion of Chinese Clinical Guidance for Covid-19 Pneumonia Diagnosis and Treatment (Seventh Edition, released by the National Health Commission of the PRC),[1] a confirmed case of Covid-19 was defined as a suspected case with a positive result on high-throughput sequencing or real-time reverse-transcriptase-polymerase-chain-reaction (RT-PCR) assay of nasal and pharyngeal swab specimens. Besides those who were diagnosed through nucleic acid tests, in order to present the entire spectrum of disease, we also included clinical confirmed cases according to the criterion of the fifth edition guideline.[2] Clinically-diagnosed cases were defined as a suspected case in Hubei province who had manifestations with

pneumonia image features on computerized tomography (CT) scan (Other potential cause of pneumonia was rule out before diagnosed). The degree of severity (severe and critical case) was classified by using the mentioned guidance. Severe cases were defined as meeting one of these conditions: 1) respiratory rate ≥ 30 breaths/min; 2) arterial oxygen tension (PaO_2) over inspiratory oxygen fraction (FIO_2) of less than 300 mmHg; 3) Percutaneous oxygen saturation (SpO_2) ≤ 93% on room air at rest. Critical cases were defined as on the following conditions: 1) occurrence of severe respiratory distress; 2) respiratory failure requiring mechanical ventilation; 3) shock and organ failure even needs of ICU care. According to the mentioned Guidance, patients met the criterion would be discharged: 1) Body temperature returns to normal for more than 3 days; 2). Respiratory symptoms improve significantly; 3) Pulmonary imaging shows significant improvement in acute exudative lesions; 4) Negative nucleic acid test of respiratory tract specimens such as sputum and nose swab for consecutive times (sampling time at least 24 hours apart).

Statistical analysis

Continuous variables were expressed as medians and interquartile ranges (IQR). Categorical variables were expressed as counts and percentages (%). No imputation was made for missing data. All statistics are descriptive only. All analyses were done with SPSS software, version 22.0.

Tables

Table S1. Hospitals of all COIVD-19 confirmed cases.

	All Patients (N=118)
Research Center-no./total no. (%)	
Union Hospital, Tongji Medical College, Huazhong University of Science and Technology	30 (25.4)
Hubei General Hospital	19 (16.1)
Zhongnan Hospital of Wuhan University	21 (17.8)
Tongji Hospital, Tongji Medical college, Huazhong University of Science and Technology	15 (12.7)
The Central Hospital of Wuhan	13(11.0)
Wuhan Jiangxia People's Hospital	4 (3.4)
Wuhan Dongxihu District People's Hospital	4 (3.4)
Wuhan Huangpi District People's Hospital	2 (1.7)
Central Theater Command General Hospital of the Chinese People's Liberation Army	3 (2.5)
Wuhan Xinzhou Hospital of Traditional Chinese Medicine	2 (1.7)
Wuhan Red Cross Hospital	2 (1.7)
Wuhan Caidian District Maternal and Child Health Care Hospital	1 (0.8)
Jinyintan Hospital	1 (0.8)
Hubei 672 Orthopaedic Hospital of Integrated Traditional Chinese & Western Medicine	1 (0.8)
Repeated hospitalization*	
Huoshenshan Hospital	2
Leishenshan Hospital	1
Wuhan Jiangxia Hospital of Traditional Chinese Medicine	1
Ninth Hospital of Wuhan	1
Fifth Hospital of Wuhan	1

* 19 of the 50 designated hospital had reported COIVD-19 confirmed cases. A total of 6 patients who were repeatedly admitted to different hospitals (whole disease course and all data of them were reviewed), which have been included in the above 118 patients.

Table S2. Demographic and clinical characteristics of pregnant women with Covid-19, by diagnostic criteria.*

	All patients (N=118)	Diagnostic criteria	
		Laboratory-diagnosed (N=84)	Clinically-diagnosed† (N=34)
Age			
Median (IQR)-year	31.0 (28.0-34.0)	31.0 (27.5-34.0)	31.0 (30.0-34.0)
Distribution-no. (%)			
< 35 years	94 (79.7)	68 (81.0)	26 (76.5)
≥ 35 years	24 (20.3)	16 (19.1)	8 (23.5)
Epidemiological history-no. (%)			
No	92 (78.0)	63 (75.0)	29 (85.3)
Exposure to confirmed or suspected patients	23 (19.5)	18 (21.4)	5 (14.7)
Familiar cluster	3 (2.5)	3 (3.6)	0 (0.0)
Parity-no./total no. (%)			
Nulliparous	55/106 (51.9)	38/75 (50.7)	17/31 (54.8)
Parous	51/106 (48.1)	37/75 (49.3)	14/31 (45.2)
Number of birth-no. (%)			
Single	116 (98.3)	83 (98.8)	33 (97.1)

Twin	2 (1.7)	1 (1.2)	1 (2.9)
Pregnancy period when infected-no./total no. (%)			
First trimester	22 (18.6)	16 (19.1)	6 (17.7)
Second trimester	21 (17.8)	18 (21.4)	3 (8.8)
Third trimester	75 (63.6)	50 (59.5)	25 (73.5)
Signs and symptoms			
Asymptomatic-no. (%)[‡]	6 (5.1)	6 (7.1)	0 (0.0)
Symptomatic-no. (%)[§]	112 (94.9)	78 (92.9)	34 (100.0)
Fever-no./total no. (%)	84/112 (75.0)	61/78 (78.2)	23 (67.7)
Highest temperature (SD)-℃[¶]	38.3 (0.6)	38.3 (0.6)	38.2 (0.5)
Distribution-no./total no. (%)			
37.3-38.0℃	32/77 (41.6)	21/54 (38.9)	11/23 (47.8)
38.1-39.0℃	39/77 (50.7)	28/54 (51.9)	11/23 (47.8)
>39.0℃	6/77 (7.8)	5/54 (9.3)	1/23 (4.4)
Cough-no./total no. (%)	82/112 (73.2)	57/78 (73.1)	25 (73.5)
Chest tightness-no./total no. (%)	20/112 (17.9)	19/78 (24.4)	1 (2.9)
Fatigue-no./total no. (%)	19/112 (17.0)	17/78 (21.8)	2 (5.9)
Dyspnea-no./total no. (%)	8/112 (7.1)	8/78 (10.3)	0 (0.0)
Diarrhea-no./total no. (%)	8/112 (7.1)	7/78 (9.0)	1 (2.9)

Headache-no./total no. (%)	7/112 (6.3)	5/78 (6.4)	2 (5.9)
Myalgia-no./total no. (%)	6/112 (5.4)	6/78 (7.7)	0 (0.0)
Nasal congestion-no./total no. (%)	5/112 (4.5)	2/78 (2.6)	3 (8.8)
Nausea or vomiting-no./total no. (%)	4/112 (3.6)	4/78 (5.1)	0 (0.0)
Chest pain-no./total no. (%)	4/112 (3.6)	4/78 (5.1)	0 (0.0)
Sore throat-no./total no. (%)	2/112 (1.8)	2/78 (2.6)	0 (0.0)

*The denominators of patients who were included in each analysis were provided if they differed from the total numbers in relevant study group. Percentages may not total 100 because of rounding. Covid-19 denotes coronavirus disease 2019, SD denotes standard deviation, and IQR denotes interquartile range.

†Clinically-diagnosed cases were defined as a suspected case in Hubei province who had manifestations with pneumonia image features on computerized tomography (CT) scan.[2]

‡Asymptomatic patients were screened due to positive exposure history with the absence of symptoms.

§Signs and symptoms collected from patients had occurred prior to admission and during hospitalization. Data extracted from medical record for symptoms may not reflect complete accounting of symptoms.

¶Data regarding highest temperature were missing for 7 patients (5.9%).

Table S3. Laboratory and radiographic findings from pregnant women with Covid-19, by disease severity and diagnostic criteria.*

		Disease severity		Diagnostic criteria	
	All patients (N=118)	**Non-severe (N=109)**	**Severe (N=9)**	**Laboratory-diagnosed (N=84)**	**Clinically-diagnosed[†] (N=34)**
Laboratory findings					
Leucocytes ($\times 10^9$ per mm^3)[‡]					
Median (IQR)	6.6 (4.9-8.5)	6.6 (4.9-8.7)	6.6 (4.9-6.9)	6.6 (5.1-8.8)	6.1 (4.3-8.3)
Distribution-no./total no. (%)					
$<3.5\times 10^9$ per mm^3	6/116 (5.2)	5/107 (4.7)	1 (11.1)	3/82 (3.7)	3 (8.8)
$>9.5\times 10^9$ per mm^3	17/116 (14.7)	17/107 (15.9)	0 (0.0)	16/82 (19.5)	1 (2.9)
Lymphocytes ($\times 10^9$ per mm^3)[§]					
Median (IQR)	1.2 (0.9-1.5)	1.3 (0.9-1.6)	0.8 (0.6-0.9)	1.1 (0.9-1.6)	1.3 (0.9-1.4)
Distribution-no./total no. (%)					
$<1.1\times 10^9$ per mm^3	51/116 (44.0)	44/107 (41.1)	7 (77.8)	40/82 (48.8)	11 (32.4)
Lymphocytes (%)[§]					
Median (IQR)	18.1 (14.3-23.9)	18.9 (14.6-25.3)	14.6 (11.1-17.7)	16.9 (14.1-22.9)	19.6 (14.9-26.8)
Platelets ($\times 10^9$ per mm^3)[¶]					

Median (IQR)	190.0 (152.0-244.0)	193.5 (156.0-244.0)	151.0 (137.0-190.0)	190.0 (155.0-242.0)	194.0 (145.0-250.0)
Distribution-no./total no. (%)					
<100×10^9 per mm^3	3/115 (2.6)	2/106 (1.9)	1 (11.1)	2/81 (2.5)	1 (2.9)
Hemoglobin (g/liter)[‖]					
Median (IQR)	116.0 (108.0-127.7)	116.5 (110.0-127.0)	98.0 (97.0-128.0)	114.0 (107.0-125.0)	121.0 (112.0-132.0)
Fibrinogen (g/liter)[**]					
Median (IQR)	4.2 (3.4-4.7)	4.2 (3.6-4.7)	3.2 (2.7-4.2)	4.2 (3.5-4.9)	4.2 (3.3-4.4)
Albumin (g/liter)[※]					
Median (IQR)	35.1 (31.8-38.3)	35.3 (33.1-38.6)	31.7 (30.5-33.2)	35.4 (31.6-38.7)	34.5 (33.4-37.2)
Distribution of other findings-no./total no.(%)					
D-dimer≥ 0.5mg/liter	85/104 (81.7)	79/96 (82.3)	6/8 (75.0)	59/72 (81.9)	26/32 (81.3)
Alanine aminotransferase>40 U/liter	21/93 (22.6)	17/84 (20.2)	4 (44.4)	15/63 (23.8)	6/30 (20.0)
Aspartate aminotransferase>40U/liter	20/94 (21.3)	14/85 (16.5)	6 (66.7)	13/63 (20.6)	7/31 (22.6)

Lactate dehydrogenase>245U/liter	23/79 (29.1)	18/71 (23.4)	5/8 (62.5)	19/54 (35.2)	4/25 (16.0)
Procalcitonin≥0.1ng/ml	16/62 (25.8)	15/59 (25.4)	1/3 (33.3)	9/46 (19.6)	7/16 (43.8)
C-reactive protein>10mg/liter	71/106 (67.0)	63/98 (64.3)	8/8 (100.0)	47/74 (63.5)	24/32 (75.0)
Chest CT findings-no./total no.(%)					
Bilateral involvement	88/111 (79.3)	79/102 (77.5)	9 (100.0)	59/77 (76.6)	29 (85.3)
Unilateral involvement	20/111 (18.0)	20/102 (19.6)	0 (0.0)	15/77 (19.5)	5 (14.7)
No abnormality	3/111 (2.7)	3/102 (2.9)	0 (0.0)	3/77 (3.9)	0 (0.0)

*The denominators of patients who were included in each analysis were provided if they differed from the total numbers in relevant study group. Percentages may not total 100 because of rounding. Covid-19 denotes coronavirus disease 2019, SD denotes standard deviation, and IQR denotes interquartile range.

†Clinically-diagnosed cases were defined as a suspected case in Hubei province who had manifestations with pneumonia image features on computerized tomography (CT) scan.[2]

‡Data regarding leucocytes were missing for 2 patients (1.7%).

§Data regarding lymphocytes were missing for 2 patients (1.7%).

¶Data regarding platelets were missing for 3 patients (2.5%).

‖Data regarding hemoglobin were missing for 3 patients (2.5%).

**Data regarding fibrinogen were missing for 28 patients (23.7%).

※Data regarding albumin were missing for 28 patients (23.7%).

Contributors

LC, QL, DNZ and HJ designed the study, collected the data, interpreted the results, and drafted the manuscript. JQ and YYZ conceived of the study, supervised the study, interpreted the results, and revised the manuscript. LC, QL, DNZ and HJ contributed equally and are considered as co-first authors. JQ and YYZ contributed equally and are considered as co-corresponding authors. YW, LZ, LF, GPX, GQS and HBW were responsible for data collection, confirmation, and revised the manuscript. All authors contributed to critical reading of, and commented on, the manuscript, helped to interpret the data, and approved the final manuscript.

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Declaration of interests

The authors declare no conflicts of interest.

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