ISSN 2307-8960 (online)

# World Journal of *Clinical Cases*

*World J Clin Cases* 2021 July 26; 9(21): 5754-6177

Published by Baishideng Publishing Group Inc

World Journal of Clinical Cases

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## RESPONSIBLE EDITORS FOR THIS ISSUE

**Production Editor:** *Ji-Hong Liu*; **Production Department Director:** *Xiang Li*; **Editorial Office Director:** *Jin-Lei Wang*.

**NAME OF JOURNAL**
*World Journal of Clinical Cases*

**ISSN**
ISSN 2307-8960 (online)

**LAUNCH DATE**
April 16, 2013

**FREQUENCY**
Thrice Monthly

**EDITORS-IN-CHIEF**
Dennis A Bloomfield, Sandro Vento, Bao-Gan Peng

**EDITORIAL BOARD MEMBERS**
https://www.wjgnet.com/2307-8960/editorialboard.htm

**PUBLICATION DATE**
July 26, 2021

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World Journal of Clinical Cases

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*World J Clin Cases* 2021 July 26; 9(21): 5955-5962

DOI: 10.12998/wjcc.v9.i21.5955

ISSN 2307-8960 (online)

CASE REPORT

# COVID-19 patient with an incubation period of 27 d: A case report

Xue Du, Yang Gao, Kai Kang, Yang Chong, Mei-Ling Zhang, Wei Yang, Chang-Song Wang, Xiang-Lin Meng, Dong-Sheng Fei, Qing-Qing Dai, Ming-Yan Zhao

**ORCID number:** Xue Du 0000-0003-3563-7389; Yang Gao 0000-0002-0612-0818; Kai Kang 0000-0001-9694-4505; Yang Chong 0000-0003-4690-4585; Mei-Ling Zhang 0000-0003-4056-3433; Wei Yang 0000-0002-8139-6048; Chang-Song Wang 0000-0002-0079-5259; Xiang-Lin Meng 0000-0001-5091-3260; Dong-Sheng Fei 0000-0002-3532-7393; Qing-Qing Dai 0000-0002-7062-4463; Ming-Yan Zhao 0000-0002-4733-7212.

**Author contributions:** Du X, Gao Y, and Zhao MY conceived the study design, carried out the study and drafted the manuscript; Kang K, Chong Y, Zhang ML, Yang W, Wang CS, Meng XL, Fei DS and Dai QQ were involved in design and execution of the study; all authors read and approved the final manuscript. Du X and Gao Y contributed equally to this work.

**Supported by** National Natural Science Foundation of China, No. 81772045; and Scientific Research Project of Heilongjiang Health and Family Planning Commission, No. 2018086.

**Informed consent statement:** The study participant provided written informed consent prior to study enrollment.

**Conflict-of-interest statement:** All authors declare that they have no conflicts of interest.

**Xue Du, Kai Kang, Yang Chong, Mei-Ling Zhang, Wei Yang, Xiang-Lin Meng, Dong-Sheng Fei, Ming-Yan Zhao,** Department of Critical Care Medicine, The First Affiliated Hospital of Harbin Medical University, Harbin 150001, Heilongjiang Province, China

**Yang Gao,** Department of Critical Care Medicine, The Sixth Affiliated Hospital of Harbin Medical University, Harbin 150028, Heilongjiang Province, China

**Yang Gao, Chang-Song Wang,** Institute of Critical Care Medicine, The Sino Russian Medical Research Center of Harbin Medical University, Harbin 150081, Heilongjiang Province, China

**Chang-Song Wang,** Department of Critical Care Medicine, The Harbin Medical University Cancer Hospital, Harbin 150081, Heilongjiang Province, China

**Qing-Qing Dai,** Department of Critical Care Medicine, The Second Affiliated Hospital of Harbin Medical University, Harbin 150086, Heilongjiang Province, China

**Corresponding author:** Ming-Yan Zhao, PhD, Chief Physician, Department of Critical Care Medicine, The First Affiliated Hospital of Harbin Medical University, No. 23 Youzheng Street, Harbin 150001, Heilongjiang Province, China. mingyan0927@yeah.net

## Abstract

### *BACKGROUND*

As a highly contagious disease, coronavirus disease 2019 (COVID-19) is wreaking havoc around the world due to continuous spread among close contacts mainly *via* droplets, aerosols, contaminated hands or surfaces. Therefore, centralized isolation of close contacts and suspected patients is an important measure to prevent the transmission of COVID-19. At present, the quarantine duration in most countries is 14 d due to the fact that the incubation period of severe acute respiratory syndrome coronavirus type 2 (SARS-CoV-2) is usually identified as 1-14 d with median estimate of 4-7.5 d. Since COVID-19 patients in the incubation period are also contagious, cases with an incubation period of more than 14 d need to be evaluated.

### *CASE SUMMARY*

A 70-year-old male patient was admitted to the Department of Respiratory Medicine of The First Affiliated Hospital of Harbin Medical University on April 5 due to a cough with sputum and shortness of breath. On April 10, the patient was transferred to the Fever Clinic for further treatment due to close contact to one confirmed COVID-19 patient in the same room. During the period from April 10 to May 6, nucleic acid and antibodies to SARS-CoV-2 were tested 7 and 4 times,

**CARE Checklist (2016) statement:** The authors have read the CARE Checklist (2016) statement, and the manuscript was prepared and revised according to the CARE Checklist (2016) statement.

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**Manuscript source:** Unsolicited manuscript

**Specialty type:** Critical Care Medicine

**Country/Territory of origin:** China

**Peer-review report's scientific quality classification**

Grade A (Excellent): 0
Grade B (Very good): B
Grade C (Good): C
Grade D (Fair): 0
Grade E (Poor): 0

**Received:** October 29, 2020
**Peer-review started:** October 29, 2020
**First decision:** February 12, 2021
**Revised:** February 16, 2021
**Accepted:** May 15, 2021
**Article in press:** May 15, 2021
**Published online:** July 26, 2021

**P-Reviewer:** Karcioglu Ö, Maurea S
**S-Editor:** Wang JL
**L-Editor:** Webster JR
**P-Editor:** Liu JH

respectively, all of which were negative. On May 7, the patient developed fever with a maximum temperature of 39°C, and his respiratory difficulties had deteriorated. The results of nucleic acid and antibody detection of SARS-CoV-2 were positive. On May 8, the nucleic acid and antibody detection of SARS-CoV-2 by Heilongjiang Provincial Center for Disease Control were also positive, and the patient was diagnosed with COVID-19 and reported to the Chinese Center for Disease Control and Prevention.

*CONCLUSION*

This case highlights the importance of the SARS-CoV-2 incubation period. Further epidemiological investigations and clinical observations are urgently needed to identify the optimal incubation period of SARS-CoV-2 and formulate rational and evidence-based quarantine policies for COVID-19 accordingly.

**Key Words:** COVID-19; Incubation period; Quarantine duration; SARS-CoV-2; Case report

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**Core Tip:** As the quarantine duration of coronavirus disease 2019 (COVID-19) in most countries is currently 14 d, cases with an incubation period of more than 14 d in the clinic may trigger rapid spread of the epidemic, which requires us to be highly vigilant. We present a COVID-19 patient with an incubation period of 27 d confirmed in the Fever Clinic of The First Affiliated Hospital of Harbin Medical University. Further epidemiological investigations and clinical observations are urgently needed to identify the optimal incubation period of severe acute respiratory syndrome coronavirus type 2 (SARS-CoV-2) and formulate rational and evidence-based quarantine policies for COVID-19 accordingly.

**Citation:** Du X, Gao Y, Kang K, Chong Y, Zhang ML, Yang W, Wang CS, Meng XL, Fei DS, Dai QQ, Zhao MY. COVID-19 patient with an incubation period of 27 d: A case report. *World J Clin Cases* 2021; 9(21): 5955-5962
**URL:** https://www.wjgnet.com/2307-8960/full/v9/i21/5955.htm
**DOI:** https://dx.doi.org/10.12998/wjcc.v9.i21.5955

## INTRODUCTION

Coronavirus disease 2019 (COVID-19), which is caused by severe acute respiratory syndrome coronavirus type 2 (SARS-CoV-2) infection, has been officially identified as a Class B infectious disease mainly involving the respiratory system. In China, the prevention and control measures for COVID-19 are required to be in accordance with Class A infectious disease[1]. SARS-CoV-2 is a novel coronavirus[2], and all individuals are susceptible to this infection. At present, no effective targeted intervention has been proposed beyond supportive treatment[3,4]. The successful experience of anti-epidemic measures in China suggest that a series of multi-faceted public health interventions can effectively control the outbreak of COVID-19[5], of which centralized isolation of close contacts and suspected patients is one of the most important measures to prevent the transmission of COVID-19. The quarantine duration in most countries is 14 d based on the predicted longest incubation period of SARS-CoV-2. It is true that cases with an incubation period of more than 14 d are rare in the clinic[6]. However, it is still of great concern to avoid the rapid spread of the epidemic from cases with an incubation period of more than 14 d, since the infected person has strong infectivity in the incubation period[7,8]. We present a COVID-19 patient with an incubation period of 27 d confirmed in the Fever Clinic of The First Affiliated Hospital of Harbin Medical University.

## CASE PRESENTATION

### *Chief complaints*

A 70-year-old male patient was admitted to the Department of Respiratory Medicine of The First Affiliated Hospital of Harbin Medical University on April 5 due to a cough with sputum and shortness of breath.

### *History of present illness*

Cough with sputum and shortness of breath appeared 2 mo ago, and the cough and dyspnea were then further aggravated.

### *History of past illness*

The patient had a medical history of hypertension and vitiligo.

### *Personal and family history*

The patient had no personal or family history.

### *Physical examination*

The patient's vital signs were stable. Rales could be heard on auscultation of both lungs.

### *Laboratory examinations*

Laboratory tests revealed the following results on admission: White blood cell count of 9.06 × $10^9$/L, neutrophil (NEUT) count of 7.34 × $10^9$/L, NEUT% of 80.90%, lymphocyte (LYMPH) count of 0.47 × $10^9$/L and percentage of lymphocytes (LYM%) of 5.20%. During the period from April 10 to May 7, blood cell analyses were reexamined (Table 1), in which LYMPH and LYM% significantly decreased.

### *Imaging examinations*

The initial lung computed tomography (CT) indicated pneumonia and multiple nodules in the lungs, bilateral pleural effusion and pericardial effusion. On May 7, reexamination of the lung CT showed patchy shadows and interstitial changes. On May 11, lung CT imaging showed that the lung lesions had rapidly deteriorated (Figure 1).

## FINAL DIAGNOSIS

On May 7, the results of nucleic acid and antibody detection of SARS-CoV-2 were positive. On May 8, the nucleic acid and antibody detection of SARS-CoV-2 by Heilongjiang Provincial Center for Disease Control were also positive, and the patient was diagnosed with COVID-19 and reported to the Chinese Center for Disease Control and Prevention.

## TREATMENT

In the initial stage of disease, the patient occasionally had shortness of breath but did not need oxygen therapy. On April 10, the patient was transferred to the Fever Clinic for further treatment due to close contact to one confirmed COVID-19 patient in the same room. During the period from April 10 to May 6, lung CT was reviewed on April 26 and 30 (Figure 1), and nucleic acid and antibody of SARS-CoV-2 were tested 7 and 4 times, respectively, all of which were negative (Table 1). Surprisingly, on May 7, the patient developed fever with a maximum temperature of 39°C, and his respiratory difficulties had deteriorated. Continuous oxygen therapy was then provided. Due to continuous deterioration of the patient's condition, a high-flow nasal cannula and invasive mechanical ventilation were given to the patient on May 7 and 11 to enhance respiratory support. In addition, comprehensive treatment measures also included antibiotic agents, analgesic and sedative drug injections, vasopressor support and immunotherapy.

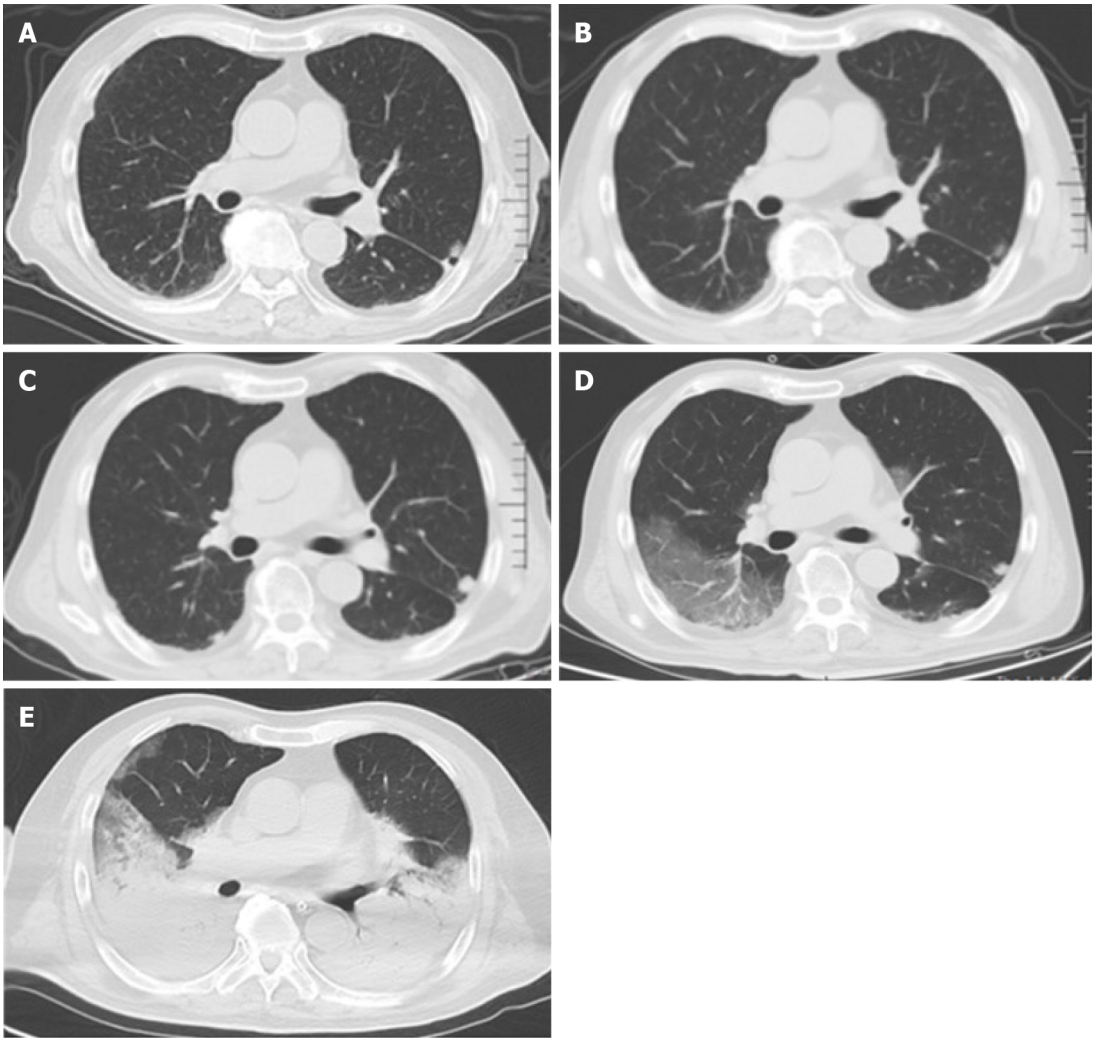


**Figure 1 Lung computed tomography scan of the patient.** A: April 5, 2020; B: April 26, 2020; C: April 30, 2020; D: May 5, 2020; E: May 11, 2020.

## OUTCOME AND FOLLOW-UP

Unfortunately, despite timely comprehensive treatment measures were taken, the patient's immune function and condition did not improve, and he eventually died.

## DISCUSSION

In April 2020, a cluster of SARS-CoV-2 infections occurred in two tertiary general hospitals in Harbin city, resulting in 66 newly confirmed patients including this case and 21 asymptomatic patients. Due to close contact to a confirmed COVID-19 patient, our patient had received relevant treatment in the Fever Clinic of our hospital for 27 d. As our hospital is the treatment center for COVID-19 in Heilongjiang Province, the ward layout, regulations, work arrangements, operation specifications and disinfection procedures in the Fever Clinic of our hospital were all in line with national regulations and standards; thus, the possibility of cross-infection in the Fever Clinic was extremely low. Therefore, by staying in the same room with a confirmed COVID-19 patient from April 5$^{th}$ to 10$^{th}$, there was a chance of contracting SARS-CoV-2.

Currently, the diagnosis of COVID-19 mainly depends on detection of SARS-CoV-2 nucleic acid on oropharyngeal and/or nasopharyngeal swabs by real-time polymerase chain reaction (RT-PCR)[9,10], although there is still a possibility of false-positive and false–negative results[11-13]. Therefore, lung CT has been proposed as an auxiliary method for the rapid diagnosis of COVID-19 due to its low rate of missed diagnosis [14]. In addition to a CT scan, abnormal findings on fluorodeoxyglucose-positron emission tomography/CT scans may confirm or exclude the presence of SARS-CoV-2 infection[15]. Bilateral and peripheral ground-glass opacities and consolidation are the

**Table 1 Timeline of the disease course (April 5 to May 11, 2020)**

| Day of illness | | 1 | 2 | 3 | 6 | 7 | 8 | 10 | 11 | 13 | 17 | 20 | 21 | 27 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Disease Course | Hospitalization | Close contact | The Fever Clinic | | | | | | | | | | | Positive PCR | | | |
| White blood cell count ($\times 10^9$/L) | 9 | | | 6.87 | | | | | 8.67 | | | | | 8.62 | | 9.69 | 6.63 |
| Lymphocyte count ($\times 10^9$/L) | 0.47 | | | 0.55 | | | | | 0.73 | | | | | 0.24 | | 0.18 | 0.12 |
| Lymphocyte percentage (%) | 5.2 | | | 8 | | | | | 8.42 | | | | | 2.82 | | 1.92 | 1.8 |
| Nucleic acid detection | | Negative | | Negative | | Negative | | Negative | | Negative | Negative | Negative | | Positive | | Positive | |
| Antibody detection IgM | | | | Negative | Negative | | Negative | | | | | | Negative | Positive | | Positive | |
| Antibody detection IgG | | | | Negative | Negative | | Negative | | | | | | Negative | Positive | | Positive | |
| Oxygen therapy | | | | | | | | | | | | | | | Oxygen therapy | HFNC | Invasive mechanical ventilation |
| CT | CT | | | | | | | | | | CT | | CT | | CT | | CT |
| Date | Apri l5 | April 10 | April 11 | April 12 | April 15 | April 16 | April 17 | April 19 | April 20 | April 22 | April 26 | April 29 | April 30 | May 6 | May 7 | May 8 | May 11 |

CT: Computed tomography; HFNC: High-flow nasal cannula; PCR: Polymerase chain reaction.

most common features of COVID-19 on lung CT imaging[16-18], which were not found in the three lung CT examinations before our patient was diagnosed with COVID-19. In addition, the patient's seven nucleic acid tests and four antibody tests for SARS-CoV-2 were all negative during the quarantine period. Following the diagnosis of COVID-19, CT imaging revealed rapid deterioration of the lungs with the typical imaging characteristics of COVID-19 over a short period of time compared with the previous CT scans[19]. Based on the above history, it was concluded that the patient had acquired SARS-CoV-2 infection due to sharing the same room with a confirmed COVID-19 patient from April 5$^{th}$ to 10$^{th}$, he then developed worse symptoms on May 7$^{th}$ and was confirmed to have COVID-19 on May 8$^{th}$. Thus, the incubation period was 27 d, which is very rare in clinical practice.

The prerequisite for determining the optimal quarantine duration is a good understanding of the incubation period. The incubation period usually refers to the time between infection and the onset of corresponding symptoms and signs or when the disease is confirmed[20], which determines the adjustment in quarantine policies.

The mainstream view is that the incubation period of SARS-CoV-2 is usually identified as 1-14 d with a median estimate of 4-7.5 d[6,21-23], and thus the current clinical practice of 14-d quarantine duration in most countries seems reasonable. However, there is a different opinion that a small proportion of COVID-19 patients have an incubation period of more than 14 d based on the estimated incubation distribution[6, 20], which will be an enormous figure considering the surge in COVID-19 patients and its rising trend. Age may be one of the explanations for the longer incubation period of COVID-19[24], while the other mechanisms are still unclear.

Definitive close contact, as shown in this case report, and some extreme cases should be considered to extend the quarantine duration during the outbreak stage of the epidemic[25,26]. When the epidemic recurred in Heilongjiang Province in April 2020, the quarantine duration was extended and the SARS-CoV-2 nucleic acid test was popularized for entry personnel, referred to as "14 + 7 + 14". Fourteen days of centralized isolation and 2 nucleic acid tests, and 7 d of centralized isolation and one nucleic acid test should be carried out at the entry point and the local region, respectively, and then 14 d of home isolation and observation should be carried out and incorporated into the grid management of the local community[27]. Prolonged quarantine duration can effectively prevent SARS-CoV-2 from spreading during the incubation period. Obviously, an extension of quarantine duration will make the already overwhelmed medical system even more overstretched, and increase the burden on society and individuals during the COVID-19 epidemic. Further epidemiological investigations and clinical observations are urgently needed to identify the optimal incubation period of SARS-CoV-2 and formulate rational and evidence-based quarantine policies for COVID-19 accordingly.

## CONCLUSION

As the quarantine duration for COVID-19 in most countries is currently 14 d, cases with an incubation period of more than 14 d in the clinic may trigger rapid spread of the epidemic, which requires us to be highly vigilant. Further studies are needed to determine the proportion of COVID-19 patients with an incubation period of more than 14 d, and weigh the costs of extending quarantine duration and the potential risks and consequences of the spread of the epidemic during the incubation period. These findings will have important implications for optimal prevention and control of COVID-19.

## ACKNOWLEDGEMENTS

We are grateful to all colleagues who worked with us in the COVID-19 treatment center of Heilongjiang Province, and all those who provided selfless advice and help for this article. We pay tribute to the medical staff who lost their lives in the national fight against the COVID-19 epidemic.

## REFERENCES

1 **National Health Commission of the People's Republic of China**. Novel coronavirus infection pneumonia is included in the management of notifiable infectious diseases. Available from: http://www.nhc.gov.cn/jkj/s7916/202001/44a3b8245e8049d2837a4f27529cd386.shtml

2 **Ou X**, Liu Y, Lei X, Li P, Mi D, Ren L, Guo L, Guo R, Chen T, Hu J, Xiang Z, Mu Z, Chen X, Chen J, Hu K, Jin Q, Wang J, Qian Z. Characterization of spike glycoprotein of SARS-CoV-2 on virus entry and its immune cross-reactivity with SARS-CoV. *Nat Commun* 2020; **11**: 1620 [PMID: 32221306 DOI: 10.1038/s41467-020-15562-9]

3 **Li H**, Liu SM, Yu XH, Tang SL, Tang CK. Coronavirus disease 2019 (COVID-19): current status and future perspectives. *Int J Antimicrob Agents* 2020; **55**: 105951 [PMID: 32234466 DOI: 10.1016/j.ijantimicag.2020.105951]

4 **Adhikari SP**, Meng S, Wu YJ, Mao YP, Ye RX, Wang QZ, Sun C, Sylvia S, Rozelle S, Raat H, Zhou H. Epidemiology, causes, clinical manifestation and diagnosis, prevention and control of coronavirus disease (COVID-19) during the early outbreak period: a scoping review. *Infect Dis Poverty* 2020; **9**: 29 [PMID: 32183901 DOI: 10.1186/s40249-020-00646-x]

5 **Pan A**, Liu L, Wang C, Guo H, Hao X, Wang Q, Huang J, He N, Yu H, Lin X, Wei S, Wu T. Association of Public Health Interventions With the Epidemiology of the COVID-19 Outbreak in Wuhan, China. *JAMA* 2020; **323**: 1915-1923 [PMID: 32275295 DOI: 10.1001/jama.2020.6130]

6 **Lauer SA**, Grantz KH, Bi Q, Jones FK, Zheng Q, Meredith HR, Azman AS, Reich NG, Lessler J. The Incubation Period of Coronavirus Disease 2019 (COVID-19) From Publicly Reported Confirmed Cases: Estimation and Application. *Ann Intern Med* 2020; **172**: 577-582 [PMID: 32150748 DOI: 10.7326/M20-0504]

7 **Huang L**, Zhang X, Wei Z, Zhang L, Xu J, Liang P, Xu Y, Zhang C, Xu A. Rapid asymptomatic transmission of COVID-19 during the incubation period demonstrating strong infectivity in a cluster of youngsters aged 16-23 years outside Wuhan and characteristics of young patients with COVID-19: A prospective contact-tracing study. *J Infect* 2020; **80**: e1-e13 [PMID: 32283156 DOI: 10.1016/j.jinf.2020.03.006]

8 **Yu P**, Zhu J, Zhang Z, Han Y. A Familial Cluster of Infection Associated With the 2019 Novel Coronavirus Indicating Possible Person-to-Person Transmission During the Incubation Period. *J Infect Dis* 2020; **221**: 1757-1761 [PMID: 32067043 DOI: 10.1093/infdis/jiaa077]

9 **Wu JT**, Leung K, Leung GM. Nowcasting and forecasting the potential domestic and international spread of the 2019-nCoV outbreak originating in Wuhan, China: a modelling study. *Lancet* 2020; **395**: 689-697 [PMID: 32014114 DOI: 10.1016/S0140-6736(20)30260-9]

10 **Escalera-Antezana JP**, Lizon-Ferrufino NF, Maldonado-Alanoca A, Alarcón-De-la-Vega G, Alvarado-Arnez LE, Balderrama-Saavedra MA, Bonilla-Aldana DK, Rodríguez-Morales AJ; LANCOVID. Clinical features of the first cases and a cluster of Coronavirus Disease 2019 (COVID-19) in Bolivia imported from Italy and Spain. *Travel Med Infect Dis* 2020; **35**: 101653 [PMID: 32247926 DOI: 10.1016/j.tmaid.2020.101653]

11 **Qiu G**, Gai Z, Tao Y, Schmitt J, Kullak-Ublick GA, Wang J. Dual-Functional Plasmonic Photothermal Biosensors for Highly Accurate Severe Acute Respiratory Syndrome Coronavirus 2 Detection. *ACS Nano* 2020; **14**: 5268-5277 [PMID: 32281785 DOI: 10.1021/acsnano.0c02439]

12 **Xiao AT**, Tong YX, Zhang S. False negative of RT-PCR and prolonged nucleic acid conversion in COVID-19: Rather than recurrence. *J Med Virol* 2020; **92**: 1755-1756 [PMID: 32270882 DOI: 10.1002/jmv.25855]

13 **Li Y**, Yao L, Li J, Chen L, Song Y, Cai Z, Yang C. Stability issues of RT-PCR testing of SARS-CoV-2 for hospitalized patients clinically diagnosed with COVID-19. *J Med Virol* 2020; **92**: 903-908 [PMID: 32219885 DOI: 10.1002/jmv.25786]

14 **Li Y**, Xia L. Coronavirus Disease 2019 (COVID-19): Role of Chest CT in Diagnosis and Management. *AJR Am J Roentgenol* 2020; **214**: 1280-1286 [PMID: 32130038 DOI: 10.2214/AJR.20.22954]

15 **Maurea S**, Mainolfi CG, Bombace C, Annunziata A, Attanasio L, Petretta M, Del Vecchio S, Cuocolo A. FDG-PET/CT imaging during the Covid-19 emergency: a southern Italian perspective. *Eur J Nucl Med Mol Imaging* 2020; **47**: 2691-2697 [PMID: 32572561 DOI: 10.1007/s00259-020-04931-7]

16 **Bernheim A**, Mei X, Huang M, Yang Y, Fayad ZA, Zhang N, Diao K, Lin B, Zhu X, Li K, Li S, Shan H, Jacobi A, Chung M. Chest CT Findings in Coronavirus Disease-19 (COVID-19): Relationship to Duration of Infection. *Radiology* 2020; **295**: 200463 [PMID: 32077789 DOI: 10.1148/radiol.2020200463]

17 **Bao C**, Liu X, Zhang H, Li Y, Liu J. Coronavirus Disease 2019 (COVID-19) CT Findings: A Systematic Review and Meta-analysis. *J Am Coll Radiol* 2020; **17**: 701-709 [PMID: 32283052 DOI: 10.1016/j.jacr.2020.03.006]

18 **Xu X**, Yu C, Qu J, Zhang L, Jiang S, Huang D, Chen B, Zhang Z, Guan W, Ling Z, Jiang R, Hu T, Ding Y, Lin L, Gan Q, Luo L, Tang X, Liu J. Imaging and clinical features of patients with 2019 novel coronavirus SARS-CoV-2. *Eur J Nucl Med Mol Imaging* 2020; **47**: 1275-1280 [PMID: 32107577 DOI: 10.1007/s00259-020-04735-9]

19 **Li X**, Zeng W, Li X, Chen H, Shi L, Xiang H, Cao Y, Liu C, Wang J. CT imaging changes of corona virus disease 2019(COVID-19): a multi-center study in Southwest China. *J Transl Med* 2020; **18**: 154 [PMID: 32252784 DOI: 10.1186/s12967-020-02324-w]

20 **Qin J**, You C, Lin Q, Hu T, Yu S, Zhou XH. Estimation of incubation period distribution of COVID-19 using disease onset forward time: a novel cross-sectional and forward follow-up study. *medRxiv* 2020 [PMID: 32511426 DOI: 10.1101/2020.03.06.20032417]

21 **Yang L**, Dai J, Zhao J, Wang Y, Deng P, Wang J. Estimation of incubation period and serial interval of COVID-19: analysis of 178 cases and 131 transmission chains in Hubei province, China. *Epidemiol Infect* 2020; **148**: e117 [PMID: 32594928 DOI: 10.1017/S0950268820001338]

22 **Ye Q**, Wang B, Mao J, Fu J, Shang S, Shu Q, Zhang T. Epidemiological analysis of COVID-19 and practical experience from China. *J Med Virol* 2020; **92**: 755-769 [PMID: 32237160 DOI: 10.1002/jmv.25813]

23 **Li Q**, Guan X, Wu P, Wang X, Zhou L, Tong Y, Ren R, Leung KSM, Lau EHY, Wong JY, Xing X, Xiang N, Wu Y, Li C, Chen Q, Li D, Liu T, Zhao J, Liu M, Tu W, Chen C, Jin L, Yang R, Wang Q, Zhou S, Wang R, Liu H, Luo Y, Liu Y, Shao G, Li H, Tao Z, Yang Y, Deng Z, Liu B, Ma Z, Zhang Y, Shi G, Lam TTY, Wu JT, Gao GF, Cowling BJ, Yang B, Leung GM, Feng Z. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus-Infected Pneumonia. *N Engl J Med* 2020; **382**: 1199-1207 [PMID: 31995857 DOI: 10.1056/NEJMoa2001316]

24 **Kong TK**. Longer incubation period of coronavirus disease 2019 (COVID-19) in older adults. *Aging Med (Milton)* 2020; **3**: 102-109 [PMID: 32661509 DOI: 10.1002/agm2.12114]

25 **Cimolai N**. More data are required for incubation period, infectivity, and quarantine duration for COVID-19. *Travel Med Infect Dis* 2020; **37**: 101713 [PMID: 32353629 DOI:

10.1016/j.tmaid.2020.101713]

26 **Khalili M**, Karamouzian M, Nasiri N, Javadi S, Mirzazadeh A, Sharifi H. Epidemiological characteristics of COVID-19: a systematic review and meta-analysis. *Epidemiol Infect* 2020; **148**: e130 [PMID: 32594937 DOI: 10.1017/S0950268820001430]

27 **Chen Q**, Gao Y, Wang CS, Kang K, Yu H, Zhao MY, Yu KJ. Exploration of transmission chain and prevention of the recurrence of coronavirus disease 2019 in Heilongjiang Province due to in-hospital transmission. *World J Clin Cases* 2021; **9**: 5420-5426 [DOI: 10.12998/wjcc.v9.i20.5420]

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