

## CT screening for early diagnosis of SARS-CoV-2 infection

Heshui Shi and colleagues<sup>1</sup> reported chest CT image characteristics of subclinical and clinical stages among 81 patients confirmed to have acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. Undoubtedly, their work is important for clinical management of coronavirus disease 2019 (COVID-19) pneumonia. However, from an epidemiological perspective, interpretation of CT for early identification of SARS-CoV-2 infection needs to be done with caution.

First, the sensitivity and specificity of CT for screening and diagnosing SARS-CoV-2 infection are unknown. Shi and colleagues<sup>1</sup> reported that the CT findings of 14 (93%) of 15 preclinical patients had ground-glass opacification. However, this study did not include suspected cases that were SARS-CoV-2 negative. RT-PCR results—the gold standard for diagnosing SARS-CoV-2 infection—corresponding to the CT findings were also not reported. Thus, the concordance between CT findings and laboratory tests was unknown. Another study showed a contradictory finding that seven (37%) of 19 asymptomatic cases had positive RT-PCR results for SARS-CoV-2 in the absence of CT changes.<sup>2</sup> Therefore,

we have adequate reason to doubt whether CT is suitable for screening asymptomatic infections.

Second, the use of CT for screening and diagnosing COVID-19 might have a disproportionate risk-benefit ratio. Large-scale use of CT will increase radiation exposure of the population, which increases the probability of uncertain biological effects in the long term.<sup>3</sup> Use of CT might also increase the risk of cross-infection if disinfection is not properly implemented. Furthermore, studies have shown that the secondary attack rate among close contacts is 9.6% (95% CI 7.9–11.8),<sup>4</sup> and asymptomatic patients account for only 1.2% of total SARS-CoV-2 infections.<sup>5</sup> These data show the little additional value CT screening has for early diagnosis of COVID-19.

The feasibility of applying CT for early diagnosis of SARS-CoV-2 infection needs more supportive evidence. We believe that use of CT in screening or early diagnosis in high-risk groups should balance risks and benefits to reduce radiation dose and potential disease burden. On the basis of current evidence and experience, we suggest that there should be clear criteria for the use of CT in diagnosis of SARS-CoV-2 infection. One criterion would be to have symptoms or signs of infection or to identify close contacts and have a positive nucleic acid screening test; another would be to treat or determine the course of the

disease. Otherwise, CT should not be recommended for screening or early diagnosis.

We declare no competing interests. YH and WC contributed equally to this work.

**Yongshun Huang, Weibin Cheng,  
Na Zhao, Hongying Qu,  
\*Junzhang Tian**  
jz.tian@163.com

Department of Clinical Laboratory (YH, NZ, HQ) and Guangdong Provincial Key Laboratory of Occupational Disease Prevention and Treatment (YH, NZ, HQ), Guangdong Province Hospital for Occupational Disease Prevention, Guangzhou, Guangdong, China; and Institute for Healthcare Artificial Intelligence Application, Guangdong Second Provincial General Hospital, Guangzhou, Guangdong 510317, China (WC, JT)

- 1 Shi H, Han X, Jiang N, et al. Radiological findings from 81 patients with COVID-19 pneumonia in Wuhan, China: a descriptive study. *Lancet Infect Dis* 2020; published online Feb 24. [https://doi.org/10.1016/S1473-3099\(20\)30086-4](https://doi.org/10.1016/S1473-3099(20)30086-4).
- 2 Zhibin H, Song C. Screening and management of asymptomatic infection of corona virus disease 2019 (COVID-19). *Chin J Prev Med* 2020; published online March 9. DOI:10.3760/cma.j.cn112150-20200229-00220.
- 3 Fernandez-Antoran D, Piedrafita G, Murai K, et al. Outcompeting p53-mutant cells in the normal esophagus by redox manipulation. *Cell Stem Cell* 2019; **25**: 329–41.
- 4 Bi Q, Wu Y, Mei S, et al. Epidemiology and transmission of COVID-19 in Shenzhen China: analysis of 391 cases and 1286 of their close contacts. *medRxiv* 2020; published online March 4. DOI:10.1101/2020.03.03.20028423 (preprint).
- 5 Novel Coronavirus Pneumonia Emergency Response Epidemiology Team. The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19) in China. *Zhonghua Liu Xing Bing Xue Za Zhi* 2020; **41**: 145–51 (in Chinese).



*Lancet Infect Dis* 2020

Published Online  
March 26, 2020  
[https://doi.org/10.1016/S1473-3099\(20\)30241-3](https://doi.org/10.1016/S1473-3099(20)30241-3)