

Serological tests facilitate identification of asymptomatic SARS-CoV-2 infection in Wuhan, China

To the Editor,

Till April 15, 2020, 83 745 confirmed cases and 3352 deaths related to coronavirus disease, 2019 (COVID-19) were reported in mainland China. Among them, 50 008 confirmed cases and 2579 deaths were from Wuhan alone. Wuhan has been sealed off since January 23, along with 16 of its neighboring cities in Hubei province included, to contain the spread of COVID-19. The institution of interventions including cordons sanitaire, traffic restriction, social distancing, home quarantine, centralized quarantine, and universal symptom survey contributed largely to the reduced spread of SARS-CoV-2.¹ The effective reproduction number of SARS-CoV-2 fluctuated above 3.0 before January 26 but decreased to less than 0.3 after March 1.

Wuhan City has lifted the lockdown and people have been allowed to resume working since April 8, 2020. A set of COVID-19-associated tests is required before resuming, including SARS-CoV-2 nucleic acid test (NAT) of nasopharyngeal swabs, chest computed tomography (CT) scan or a SARS-CoV-2-specific serological test.^{2,3} These tests are presumed to identify COVID-19 patients or asymptomatic SARS-CoV-2 infections.^{3,4} As few confirmed cases were found in Wuhan after April 8, it is essential to investigate the positive rate of this “tests for resume”, which might help in evaluation, to some degree, of the herd immunity of the city.

Here, we report the positive rate of COVID-19 tests based on NAT, chest CT scan and serological SARS-CoV-2 test, from April 3 to 15 in a hospital in Qingshan District, Wuhan. The hospital has reopened for non-COVID-19 patients since the end of March. We compared data from two groups of tested people: one was those applying for permission of resume ($n = 1021$), another was hospitalized patients from April 3 to 15 ($n = 381$). The NAT tests were performed as described,² and the serological SARS-CoV-2 test kits were performed according to the manufacturer's instructions (Beijing Innovita Biological Technology Co, Ltd; 2019-nCoV Ab Test (Colloidal Gold)). This study was approved by the Ethics Committee of the CR & WISCO General Hospital, Wuhan.

There was no SARS-CoV-2 NAT positive from any of the 1021 subjects in the resuming group. However, in the 381 hospitalized patients group, one female was NAT, immunoglobulin M (IgM), and IgG positive. She is 55 years old and was recently discharged from the designated hospital because of COVID-19. She was sent back to the designated hospital immediately after the NAT test. The remaining 380 hospitalized patients were all NAT negative.

Interestingly, another 39 (39/380, 10.26%) hospital patients were IgG positive but were all IgM and NAT negative. Meanwhile, there were 98 (98/1021, 9.60%) from the resuming group that were IgG positive and IgM and NAT negative. A part of these people had

no history of COVID-19. These IgG⁺IgM⁻NAT⁻ individuals with no history of COVID-19 probably suggested a recovered asymptomatic SARS-CoV-2 infection.

In conclusion, we observed a ~10% SARS-CoV-2-specific IgG positive rate from a single-center investigation. The combination of SARS-CoV-2 NAT and serological tests might facilitate the identification of COVID-19 or the asymptomatic SARS-CoV-2 subjects. A large-scale investigation is required to evaluate the herd immunity of the city, both for the resuming people and the reopened city.

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CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

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