Letters

RESEARCH LETTER

Positive RT-PCR Test Results in Patients Recovered From COVID-19

Previous studies on coronavirus disease 2019 (COVID-19) mainly focused on epidemiological, clinical, and radiological features of patients with confirmed infection.[1-4] Little attention has been paid to the follow-up of recovered patients.

Methods | One hospitalized patient and 3 patients (all medical personnel) quarantined at home with COVID-19 were treated at Zhongnan Hospital of Wuhan University, Wuhan, China, from January 1, 2020, to February 15, 2020, and evaluated with real-time reverse transcriptase–polymerase chain reaction (RT-PCR) tests for COVID-19 nucleic acid to determine if they could return to work. All the following criteria[5] had to be met for hospital discharge or discontinuation of quarantine: (1) normal temperature lasting longer than 3 days, (2) resolved respiratory symptoms, (3) substantially improved acute exudative lesions on chest computed tomography (CT) images, and (4) 2 consecutively negative RT-PCR test results separated by at least 1 day.

The RT-PCR tests were performed on throat swabs following a previously described method.[1] The RT-PCR test kits (BioGerm) were recommended by the Chinese Center for Disease Control and Prevention. The same technician and brand of test kit was used for all RT-PCR testing reported; both internal controls and negative controls were routinely performed with each batch of tests.

Demographic information, laboratory findings, and radiological features were collected from electronic medical records. After recovery, patients and their families were contacted directly, and patients were asked to visit the hospital to collect throat swabs for the RT-PCR tests.

This study was approved by the Zhongnan Hospital of Wuhan University institutional review board and the need for informed consent was waived.

Results | All 4 patients were exposed to the novel 2019 coronavirus through work as medical professionals. Two were male and the age range was 30 to 36 years. Among 3 of the patients, fever, cough, or both occurred at onset. One patient was initially asymptomatic and underwent thin-section CT due to exposure to infected patients. All patients had positive RT-PCR test results and CT imaging showed ground-glass opacification or mixed ground-glass opacification and consolidation. The severity of disease was mild to moderate.

Antiviral treatment (75 mg of oseltamivir taken orally every 12 hours) was provided for the 4 patients. For 3 of the patients, all clinical symptoms and CT imaging abnormalities had resolved. The CT imaging for the fourth patient showed delicate patches of ground-glass opacity. All 4 patients had 2 consecutive negative RT-PCR test results. The time from symptom onset to recovery ranged from 12 to 32 days.

After hospital discharge or discontinuation of quarantine, the patients were asked to continue the quarantine protocol at home for 5 days. The RT-PCR tests were repeated 5 to 13 days later and all were positive. All patients had 3 repeat RT-PCR tests performed over the next 4 to 5 days and all were positive. An additional RT-PCR test was performed using a kit from a different manufacturer and the results were also positive for all patients. The patients continued to be asymptomatic by clinician examination and chest CT findings showed no change from previous images. They did not report contact with any person with respiratory symptoms. No family member was infected.

Discussion | Four patients with COVID-19 who met criteria for hospital discharge or discontinuation of quarantine in China (absence of clinical symptoms and radiological abnormalities and 2 negative RT-PCR test results) had positive RT-PCR test results 5 to 13 days later. These findings suggest that at least a proportion of recovered patients still may be virus carriers. Although no family members were infected, all reported patients were medical professionals and took special care during home quarantine. Current criteria for hospital discharge or discontinuation of quarantine and continued patient management may need to be reevaluated. Although false-negative RT-PCR test results could have occurred as suggested by a previous study,[6] 2 consecutively negative RT-PCR test results plus evidence from clinical characteristics and chest CT findings suggested that the 4 patients qualified for hospital discharge or discontinuation of quarantine.

The study was limited to a small number of patients with mild or moderate infection. Further studies should follow up patients who are not health care professionals and who have more severe infection after hospital discharge or discontinuation of quarantine. Longitudinal studies on a larger cohort would help to understand the prognosis of the disease.

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