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Letters to the Editor

Seven discharged patients turning positive again for SARS-CoV-2 on quantitative RT-PCR



To the Editor:

Since December 2019, the outbreak of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has gradually become a global health concern.¹ As of March 23, 2020, 332,930 people had a confirmed infection and 14,510 people died worldwide.² Up to now, respiratory droplets and close contact were considered as the major transmission route of COVID-19.³ Here, we report the clinical and epidemiological characteristics of 7 discharged patients who turned positive again (named as turn-positive patients) for SARS-CoV-2 on quantitative RT-PCR (qRT-PCR). The detailed timeline is presented in [Appendix 1](#).

On January 17, 2020, patient 1 (male, 67-year-old), who had travelled from Wuhan (Hubei, China) to Guangzhou (Guangdong, China), had a fever (37.8°C) and cough with abnormal chest X-ray images, and his throat swab was positive on qRT-PCR (January 24). Patient 2 (son-in-law of patient 1) had a fever (38.9°C) and chills but no cough with normal X-ray and positive throat swab (January 24). Patient 3 (wife of patient 1) had no fever (37.0°C) but cough, expectoration, normal X-ray, and positive throat swab (January 27). Patient 4 (grandson of patient 1) had no fever (36.3°C) but cough, normal X-ray, and positive throat swab (Jan 27). All patients were successively admitted to our hospital. After treatment for 18 days (patient 1 and 2), 19 days (patient 3), or 12 days (patient 4), they were discharged with no symptoms and normal imaging and qRT-PCR results (discharge criteria).⁴ On February 19, patient 1 was readmitted to our hospital with no symptoms but abnormal computed tomography (CT) images and positive qRT-PCR results. On Feb 22, patient 2, 3, and 4 were readmitted to our hospital with no symptoms, normal (patient 4) or abnormal CT images (patient 2 and 3), positive nasal swab but negative throat or anal swab on qRT-PCR. During the second hospitalization, nonorganic insomnia and increased anxiety was observed in patients 2 and 3. After treatment for 6 days (patient 1), 5 days (patient 2 and 4), or 7 days (patient 3), they were discharged but quarantined in our hospital.

On January 24, patient 5 (female, 38-year-old), who returned to Guangzhou from Wuhan and on January 29, patient 6 (male, 29-year-old), whose father had returned to Guangzhou from Wuhan,

presented with fever (37.5°C and 38.2°C, respectively) but no cough and had normal X-ray but positive throat swab. Patient 7 (female, 21-year-old) had a fever (37.3°C), itchy throat but no cough, normal X-ray but positive qRT-PCR results (January 31). Patients 5, 6, and 7 were admitted to our hospital. After treatment for 18 days (patient 5), 17 days (patient 6), or 15 days (patient 7), they met the discharge criteria and were discharged. Patients 5 and 6 moved to a hotel, whereas patient 7 went home. On February 22, patient 5 was readmitted to our hospital with no symptoms and normal X-ray but positive throat swab. On February 26, patient 6 was readmitted to our hospital with no symptoms, normal CT, and negative throat swab but positive anal swab. On February 24, patient 7 was readmitted to our hospital with no symptoms but abnormal CT, positive nasal swab but negative throat or anal swabs. During treatment, negative throat swab but positive anal swab was observed on patient 5 (February 24) and patient 6 (February 27, February 28, March 2, March 3, and March 4). After treatment for 8 days (patient 5), 10 days (patient 6), or 5 days (patient 7), they were discharged but quarantined in our hospital.

These cases highlight important issues that need our immediate attention. First, all 7 turn-positive patients had shorter hospital stays, lower medical costs, and milder symptoms in their second hospital visit than in their first-time hospitalization ([Appendix 2](#)). These findings may be attributed to convalescent plasma as a potential therapy for SARS-CoV-2 infection,⁵ which will be beneficial in the fight against COVID-19. Second, positive anal swab but negative throat swab was observed in 2 turn-positive patients (patient 5 and 6), and the diagnostic value of anal swab test in late stage of infection requires further investigation. Meanwhile, fomite transmission and environmental contamination by COVID-19 patients should not be ignored.^{6–8} Imaging examination and qRT-PCR results were sometimes inconsistent, and therefore, a combination of these methods should be used for diagnoses.⁸ Four of the turn-positive patients (patient 1–4) were from one family, suggesting that the occurrence of turn-positive patients in family cluster is a non-negligible phenomenon. Furthermore, we should consider the possibility that the turn-positive patients were not completely cured the first time and were discharged based on a false-negative diagnostic test. To avoid false-negative diagnosis of positive patients, diagnostic tests with high specificity and sensitivity are urgently needed. Finally, nonorganic insomnia and increased anxiety was observed in 2 turn-positive patients (patient 2 and 3) indicating that timely mental health care for the SARS-CoV-2 infected patients is urgently needed,⁹ especially turn-positive patients who require rehospitalization and medical observation for 14 days after discharge.¹⁰

As a new infectious disease, the pathogenesis and epidemiological and clinical characteristics of SARS-CoV-2 infection is still not well understood.^{1,10} Further studies on turn-positive patients

infected with SARS-CoV-2 will deepen our understanding of the whole process of occurrence, development, and transformation of COVID-19.

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SUPPLEMENTARY MATERIALS

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Jianhui Peng, MD

Department of Quality Management, Guangdong Second Provincial General Hospital, Guangzhou, Guangdong, China

Mingke Wang, PhD*

Department of Epidemic Prevention, No. 92371 Unit Hospital of PLA, Fuding, Fujian, China

Gangqing Zhang, PhD**

Department of Hospital Affairs, Guangdong Second Provincial General Hospital, Guangzhou, Guangdong, China

Eying Lu, MD

Department of Infectious Disease, Guangdong Second Provincial General Hospital, Guangzhou, Guangdong, China

* Address correspondence to Mingke Wang, PhD, Department of Epidemic Prevention, No. 92371 Unit Hospital of PLA, No.21, Haida Rd, Fuding, Fujian, 355200, China.

** Address correspondence to Gangqing Zhang, PhD, Department of Hospital Affairs, Guangdong Second Provincial General Hospital, No.466, Xingangzhong Rd, Haizhu District, Guangzhou, Guangdong, 510317, China

E-mail addresses: wmke020@sina.com (M. Wang), 15813368002@163.com (G. Zhang).

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Low-cost production of handrubs and face shields in developing countries fighting the COVID19 pandemic



To the Editor(s):

The COVID-19 caused by the novel coronavirus now known as SARS-CoV-2 (severe acute respiratory syndrome coronavirus-2), has spread worldwide with its first reported case in late December 2019 in Wuhan city of China.¹

This rapidly growing pandemic has also affected many healthcare workers. A recent report from China classified an overall 14.8% of confirmed cases among health workers as severe or critical and 5 deaths were observed.²

Presently, the clinical spectrum of the disease is being defined including the potential for asymptomatic spread.³ So far, no specific treatment and prevention strategies like targeted antiviral drugs and vaccines are available for COVID-19. Thus, we can only depend on the traditional public health outbreak response practices— isolation, quarantine, social distancing, and community containment.⁴

Such times call for judicious and appropriate use of personal protective equipment (PPE)—gloves, masks, face shields, and handrubs among healthcare workers. In populous countries like India, judicious use of PPE can be a game-changer. Thus, the Infection Control Team at the JPNA Trauma Center, AIIMS, New Delhi has taken measures such as in-house production of the WHO-recommended handrubs on a large scale and indigenous face shields to be used by the healthcare workers in the hospital (Fig 1).⁵

The usefulness of both the in-house developed PPE has been tested by the treating clinicians at the Center. Both the formulations of handrubs—ethanol & isopropyl alcohol, have proved to be effective. The in-house made face shields were prepared using the readily available materials like foam, transparency sheets, and elastic bands. The cost of each face shield was just 15 Indian rupees INR. It took us approximately 2 minutes to make each face shields. The residents wore the face shield for almost 4 hours without discomfort. Such cost-effective measures towards preparedness to battle the pandemic could be taken by all healthcare facilities across the globe, to overcome the expected crises of PPE and halt the outbreak. With the expected shortage of masks, we are also looking at the option to make triple-layered masks using indigenous materials.