Prolonged Viral RNA Shedding Duration in COVID-19

To the Editor:

Recently, coronavirus disease 2019 (COVID-19), which was caused by the severe acute respiratory syndrome coronavirus (SARS-CoV-2), has been spreading rapidly in more than 100 countries, and the outbreak becomes a global public health concern.^{1,2} It is well known that controlling the source of infection and blocking the route of transmission were most important measurement for this disease.² The level and duration of SARS-CoV-2 virus replication are important factors in assessing the risk of transmission and guiding decisions regarding isolation of patients. A previous study reports the median duration of viral shedding was 20 days (interquartile range 17–24) in

survivors.³ Here, we report a young male patient with the viral RNA shedding duration of 45 days.

A 34-year-old man without underlying diseases in Wuhan City suffered from fever (38°C) and myalgia since January 30, 2020. He received orally oseltamivir and moxifloxacin. Five days later, he reported no fever, but myalgia remains persisted and diarrhea emerged. Chest X-ray showed normal, but computed tomography (CT) scan showed multiple ground glass shadows in the right side of lung (Figures 1A–D). Routine blood tests showed leukocyte count of $6.82 \times 10^9/L$ and lymphocyte count of $1.64 \times 10^9/L$. The pharyngeal swabs specimens were obtained for nucleic acid of SARS-CoV-2 PCR detection. Result was positive.

FIGURE 1. The chest CT scan and clinical course. (A) Chest X-ray showed normal. (B) CT scan showed multiple ground glass shadows (red arrows) in the right side of his lung. (C, D) Repeated CT scan showed disappeared ground glass shadows. (E) Clinical course of major symptoms, outcomes, treatment, and duration of viral shedding from illness onset.

He was diagnosed with COVID-19 infection. The blood gas analysis showed pH 7.45, PaCO₂ 42.7 mm Hg, PaO₂ 101 mm Hg, SpO₂ 99%. As there were no targeted antiviral drugs for SARS-CoV-2 in February 2020 in China, he received orally darunavir/cobicistat. Although the symptom relieved, the pharyngeal swabs test remained positive and the CT scan showed no absorption. So, he was admitted for further treatment. The hs-CRP was 2.8 mg/L (normal reference: 0–10 mg/L). Serum ferritin was 755.3 µg/L (normal reference: 30–400 µg/L). The cytokines (including IL-6, IL-1β, IL-8, and IL-10) were all normal. procalcitonin and d-dimer were normal. The IgM antibody of influenza virus A and B was negative. He received orally lopinavir-ritonavir treatment and pharyngeal swabs test per week. The CT scan showed normal in a week, but the pharyngeal swabs test remained positive. After 20 days, successive twice pharyngeal swabs test showed negative, and he discharged (Figure 1E).

Update, there are no vaccine or target drugs for SARS-CoV-2. Most critical measurements included controlling virus source and blocking transmission route.^{1,2} Isolation of infectious subject would help to prevent the rapid spread of COVID-19. Duration of infectious virus replication is a crucial factor in evaluating the transmission risk. A previous study reports the median duration of viral shedding was 20 days (interquartile range 17–24) in survivors.³ The longest duration of viral shedding was 37 days in survivors. In this study, we showed the patient with duration of viral shedding of 45 days, which was longer than the previous reports. As the first pharyngeal swabs test was 5 days after the respiratory symptom, the actual duration of viral shedding might be far more than 45 days. It might be the longest viral shedding duration of COVID-19 to date.

It is easy to define COVID-19 with respiratory or digestive symptom, but it remains difficult to identify the asymptomatic infectious subjects.⁴ In this report, the patient had no infectious symptom and no shadow in CT scan after a week of lopinavir-ritonavir treatment, but his pharyngeal swabs test remain positive. Moreover, this status persisted for more 2 weeks after radiology cure. This might challenge our discharged criterion of COVID-19 treatment. It is crucial to distin-

guish and isolate asymptomatic subjects to control the outbreaks in later stages.⁴ As too many details of COVID-19 are unknown to us, further research of SARS-CoV-2 is essential.

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