Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Correspondence

A family cluster of COVID-19 involving an asymptomatic case with persistently positive SARS-CoV-2 in anal swabs

To the Editor,

In December 2019, coronavirus disease 2019 (COVID-19) emerged in Wuhan, China and spread throughout the world rapidly [1,2]. Several studies have described the epidemiologic and clinical characteristics of COVID-19 patients [1–3]. The clinical spectrum of COVID-19 varies from mild to critically illness [3]. We report a family cluster of two patients with COVID-19 involving an asymptomatic case with normal blood routine tests and chest CT images but positive of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) nucleic acid in swab samples, especially in anal swab samples.

A 35-year-old woman (Patient 1) with a 1-day history of fever and

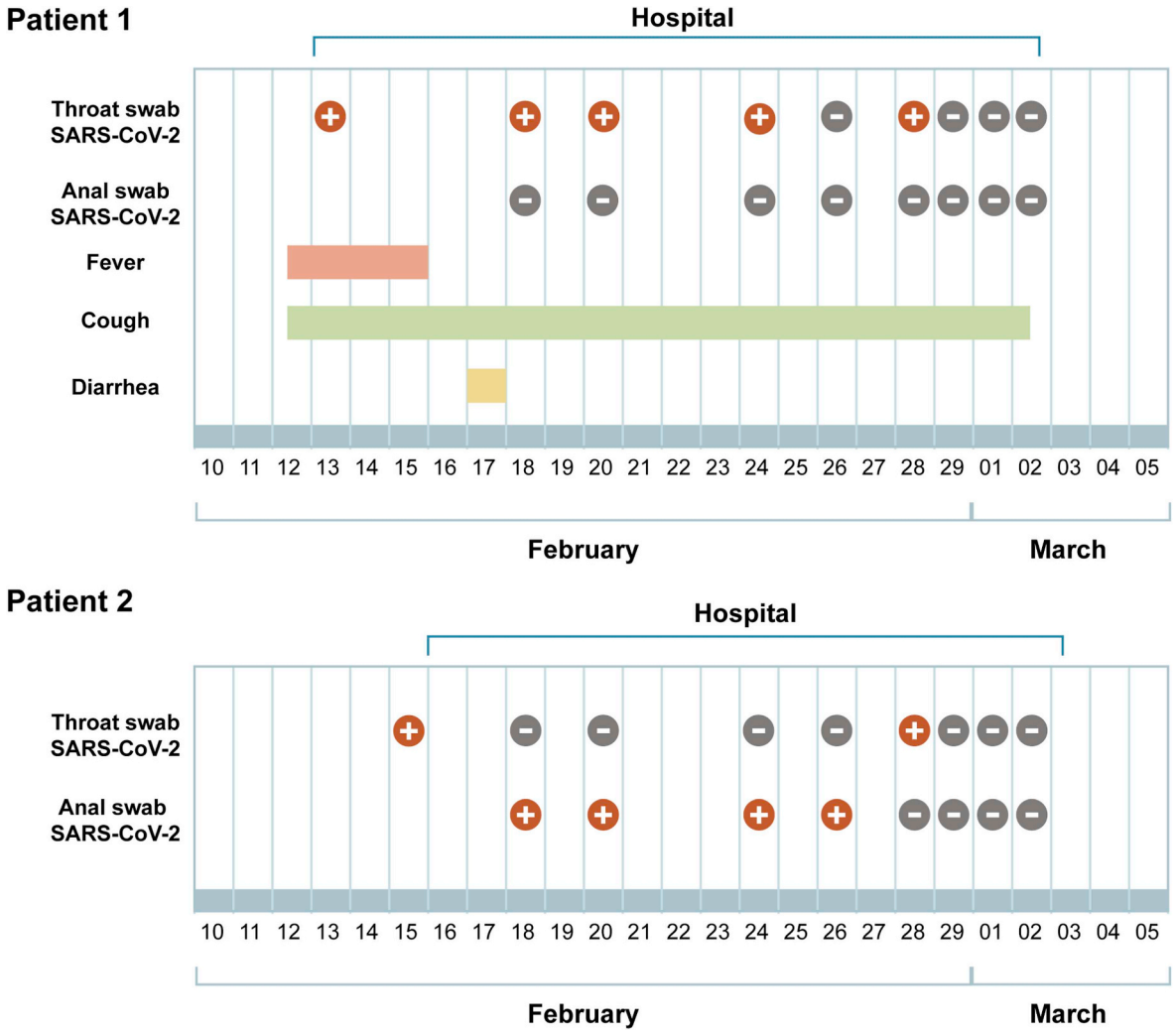

Fig. 1. Course of illness of a family cluster of patients with SARS-CoV-2 infection.

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cough was admitted to a local hospital in Suqian, China, on Feb 13, 2020 (Fig. 1). A throat swab sample was collected for the screening of SARS-CoV-2 nucleic acid and tested positive for SARS-CoV-2 nucleic acid by real-time polymerase chain reaction according to the recommended protocol [4]. This patient was isolated and transferred to the designated hospital in Suqian, China for further treatment. She had a suspect contact history of confirmed COVID-19 cases within two weeks of symptom onset. She presented normal lymphocytes but significantly elevated C-reactive protein level on admission. The chest CT images presented ground-glass opacities in both lungs. After treatment, her fever disappeared on Feb 16. Her throat swab samples were confirmed to be negative for SARS-CoV-2 nucleic acid on Feb 29. As shown in Fig. 1, the Patient 1 had been tested negative for SARS-CoV-2 nucleic acid in anal swab samples during hospitalization. All the symptoms disappeared and she was discharged on Mar 02.

A 54-year-old woman (Patient 2), the mother-in-law of Patient 1, who lived together with Patient 1 was asked for the screening of SARS-CoV-2 nucleic acid and tested positive for SARS-CoV-2 nucleic acid in throat swab sample on Feb 15. She was immediately transferred to the designated hospital for isolation and treatment in Suqian, China. She had no signs or clinical symptoms, with normal blood routine tests. Her chest CT images did not show significant abnormalities. After admission, she was treated with lopinavir-ritonavir, arbidol, and atomized inhalation of interferon α-2b. During the hospitalization, she was completely asymptomatic. The throat swab sample became negative for SARS-CoV-2 nucleic acid on Feb 18. However, as shown in Fig. 1, the Patient 2 was positive for SARS-CoV-2 nucleic acid in anal swab samples on Feb 18, 20, 24, and 26. The SARS-CoV-2 nucleic acid became negative in anal swab sample on Feb 28. Both anal and throat swab samples were tested negative for SARS-CoV-2 nucleic acid on Feb 29. She was discharged on Mar 03.

This family cluster of COVID-19 patients involved an asymptomatic case (Patient 2) who was diagnosed with COVID-19 by SARS-CoV-2 nucleic acid screening. After treatment, the SARS-CoV-2 nucleic acid became negative in throat swab samples, while the anal swab samples continued to be positive for SARS-CoV-2 nucleic acid for at least 9 days. However, several reports noted that the anal swab samples from some COVID-19 patients were positive for SARS-CoV-2 nucleic acid [5–8]. Fan et al. reported an infant with COVID-19 who was negative for SARS-CoV-2 nucleic acid in oropharyngeal specimen on the 14th day after onset of the illness while the anal swab was still positive for SARS-CoV-2 nucleic acid on the 28th day after the illness onset [5]. Liu et al. reported an 8-year-old boy who was positive for SARS-CoV-2 nucleic acid in anal swab for at least 9 days after discharge [6]. Wu et al. analyzed the SARS-CoV-2 nucleic acid in various biological samples of COVID-19 patients and found that the positive rate of SARS-CoV-2 nucleic acid in anal swabs was 10.00% [7]. Zhang et al. also found the presence of SARS-CoV-2 nucleic acid in anal swabs and more anal swab positives than oral swab positives in a later stage of infection [8]. However, few studies reported the presence of SARS-CoV-2 nucleic acid in anal swabs in asymptomatic adult patients. Our study reported an asymptomatic adult patient who was positive for SARS-CoV-2 nucleic acid in anal swab samples for at least 9 days after the SARS-CoV-2 nucleic acid became negative in throat swab samples. Thus, the possibility of fecal-oral transmission by asymptomatic carriers need to be taken into account. This family cluster of COVID-19 provides important evidence that individuals with family members infected by SARS-CoV-2 should be closely monitored and tested for SARS-CoV-2 nucleic acid both in anal and throat swab samples to rule out infection, even if they do not present any symptom.

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Declaration of competing interest

None of the authors has any conflict of interest to declare.

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