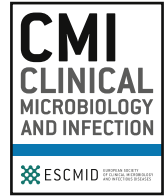




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Letter to the Editor

A report of three COVID-19 cases with prolonged viral RNA detection in anal swabs

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ARTICLE INFO

Article history:

Received 25 February 2020

Received in revised form

9 April 2020

Accepted 10 April 2020

Available online 15 April 2020

Editor: M. Cevik

To the editor

An outbreak of coronavirus disease 2019 (COVID-19), caused by novel coronavirus SARS-CoV-2, started in December 2019 at Wuhan, China [1], and has spread widely in the world. The pattern of human-to-human transmission involves mainly droplet and contact. Aerosol transmission might happen in a confined space with a high concentration of aerosol, according to the 7th edition of diagnosis and treatment recommendations for COVID-19 released by the National Health Commission of China [2]. Although faecal–oral transmission has yet to be confirmed, in the first reported COVID-19 case in the United States Michelle et al. detected viral nucleic acid in a stool specimen by real-time RT-PCR (rRT-PCR) [3]. This indicated the possibility of transmission of virus discharged from the bowel. However, during hospital isolation of this patient, viral nucleic acid in the stool specimen rapidly turned negative as compared to the respiratory samples, indicating a low possibility of community contamination.

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From January 24–26, 2020, we received three mild COVID-19 cases who had a history of travel to Wuhan in the Deqing People's Hospital, Zhejiang, China (Supplementary Material, Case Description). All the patients came to the hospital because of fever with or without respiratory symptoms, and were isolated for observation and treatment. Nasopharyngeal and anal swabs were collected every 1–3 days for detection of SARS-CoV-2 nucleic acids. Anal swabs were negative in the early illness periods (Fig. 1). rRT-PCR was performed using commercial kits (Biogerm, Shanghai, China) according to the manufacturer's instructions. Orf1ab (FAM reporter) and N (VIC reporter) genes of SARS-CoV-2 were detected. Samples were considered to be positive when PCR gave rise to reliable signals (Ct ≤ 38) for either or both genes (see Supplementary Material).

After nucleic acid tests turned negative in the respiratory specimens on illness day 15 in case 1 and illness day 11 in case 2, anal swabs from these two cases (without gastrointestinal symptoms) remained persistently positive by PCR for 5 and 15 days respectively (Fig. 1).

Typically, the patients could be released from isolation after the virus tested negative in the respiratory tract by PCR. As described in a retrospective study, in 137 survivors from COVID-19, the median duration of viral shedding detected in respiratory specimens was 20 days from illness onset [4]. Nonetheless, patients with respiratory infection may also shed the virus through stool. The presence in anal swabs or stools of SARS-CoV-2 RNA has been shown in several studies [3,5–7], with a positive rate of 39.3% (11 of 28 patients) [6]. However, RNA detection by PCR does not correlate with the risk of transmission. In a recent *Nature* paper, the German researchers failed to isolate virus from stool samples despite a high virus RNA concentration in a total of 13 samples from four patients with COVID-19 [7].

There are three possible sources of the viral RNA in the anal swabs: (a) sputum that was swallowed, (b) shed gastrointestinal cells infected with the active virus via an oral route, and (c) anal cells infected with the active virus via direct contact. In this study we could not determine which source applied to these patients or whether the detected viral RNA was from live or dead virus. Until 15th March, 2020, only one study showed that active SARS-CoV-2 virus had been isolated from patients' stool in China (mentioned

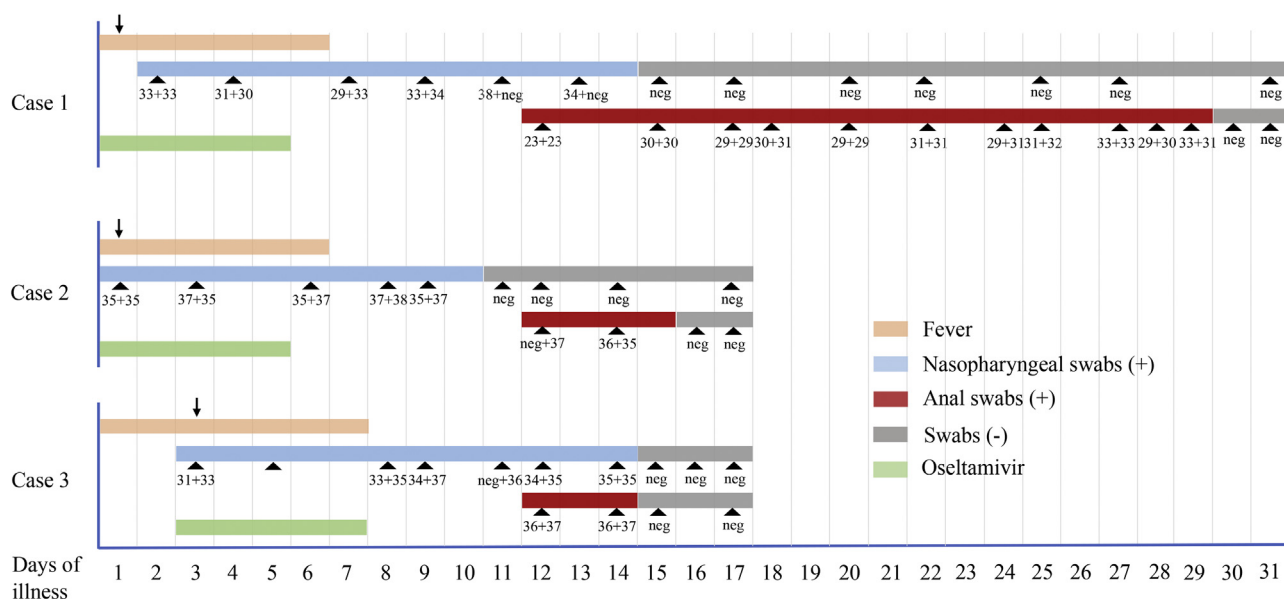


Fig. 1. Diagram of viral detection, fever, and oseltamivir administration in the three cases. SARS-CoV-2 nucleic acids turned negative in the anal swabs 15 and 5 days later than in the nasopharyngeal swabs in cases 1 and 2, respectively. Illness day represents the patients with clear clinical symptoms such as fever (labelled). The black arrows point to the admission day of each case. Virus nucleic acids were tested by real-time RT-PCR. Ct values are shown as Orf1ab+N genes. Oseltamivir was administered in an oral dose of 75 mg twice daily.

in a consensus [8], data not published). To date, however, there is no conclusive evidence that SARS-CoV-2 virus can be transmitted via the oral–faecal route. Nonetheless, many coronaviruses can be transmitted in this way [5]. In SARS-CoV- and MERS-CoV-infected patients, intestinal infection was observed at later stages of infection [9,10]. Thus, we need more evidence on whether viral shedding shown by PCR demonstrates that the virus can be transmitted through faeces.

This study has been reviewed and approved by the Research Ethics Committee of the Deqing People's Hospital (ref# LL2020-01). The patients gave their consent for publication of clinical details, and written informed consents were obtained.

Author contributions

YH and LS contributed equally to this study.

Transparency declaration

All authors declare no conflicts of interest. This work was supported by funding for COVID-19 from Jiaxing Science and Technology Bureau (2020GZ30001). The research funding was provided to Dr Hua Zhou.

Acknowledgements

We thank Tao Wang from the laboratory department, Deqing People's Hospital, and Yongying Zhu, Meiyong Yu, Haiyan Feng and Minfang Yao from Centers for Disease Control and Prevention (CDC) Laboratory Division in Deqing County.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.cmi.2020.04.010>.

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