

Long-term intermittent detection of SARS CoV 2 in the upper respiratory tract: what is the meaning of it?

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Long-term intermittent detection of SARS CoV 2 in the upper respiratory tract: what is the meaning of it?

To the Editor,

Intermittent SARS CoV 2 infection has been scarcely reported during the COVID-19 pandemic, and its potential for transmission remains controversial. After carefully evaluating the article published in this journal by Qian et al. [1] on SARS CoV 2 shedding, we discuss the relevance and developments of this phenomenon based on our experience, described in the following case, as well as that of other authors.

GCN, a 24-year-old clinical laboratory professional residing in metropolitan area of Rio de Janeiro, Brazil, without risk factors for COVID-19, reported headache only without respiratory symptoms on April 2020. The patient had respiratory material collected (oropharynx and nasopharynx swabs) for SARS-CoV-2 investigation by RT-qPCR using Allplex™2019-nCoV Assay (Seegene Inc., Seoul, Korea), and cycle threshold (Ct) measurements were obtained. ELISA test (Vircell, Spain) was used to investigate SARS CoV 2 specific IgM/IgA and IgG antibodies. Being a clinical laboratory professional, GCN was tested regularly for SARS CoV 2 RNA and antibody detection. [Figure 1](#) shows the timeline of events from April 23 to October 05, totalling 165 days. An overall RT-PCR Ct mean of 37.6 was observed over the positive periods. In every SARS CoV 2 detection, the patient followed the recommended isolation protocol and remained at home for 14 days being in contact only with close family members, without neglecting protective measures. Family members showed no signs of COVID-19, although they had not been tested. All negative RT-PCR tests were repeated.

In disagreement with the report by Qian et al., our case did not require hospitalisation, but was similar for the long period of intermittent viral shedding with high

Ct values (range of 31.3–39.7). Re-positive low shedding ($Ct \geq 37$) have been already reported in asymptomatic patients [2] and a recent report on hospitalised COVID-19 patients showed 38.2% of intermittent shedding [3], indicating the phenomenon could be frequent. Although asymptomatic transmission is established, viral isolation tests fail to demonstrate infectious particles much longer than 8 days [4]. Therefore, we could not rule out a possible RNA detection in nasal cavity not related to an active infectious process but residual RNA after viral lysis and destruction [3] or even false-positive tests [5].

Reports on re-positive tests are increasing and may be the result of both re-infections and viral reactivation [6], although problems in collecting samples could also forge 're-infections' [7]. Besides, alternating periods of non-detection may simply indicate the presence of genetic material below the test cut-off. Finally, from the immunological perspective, a less active T-cell response and lower levels of pro-inflammatory cytokines could also explain this phenomenon [3]. The absence of detectable antibodies also indicate that a humoral response was not properly developed [5].

Being a retrospective hospital case, Qian et al. did not elaborate on the possible consequences of SARS CoV 2 shedding. Some studies indicate low viral loads are not implicated in viral transmission and patients with Ct values ≥ 34 are no longer contagious [8]. In another study published in this journal, 27 individuals who had COVID-19 were followed after discharge, with no case of transmission being observed among close contacts [9]. This being the case, strict isolation measures, including those of highly relevant professionals in the context of the pandemic, is debateable [10]. In our report, during the timeline of events, two other GCN co-workers had

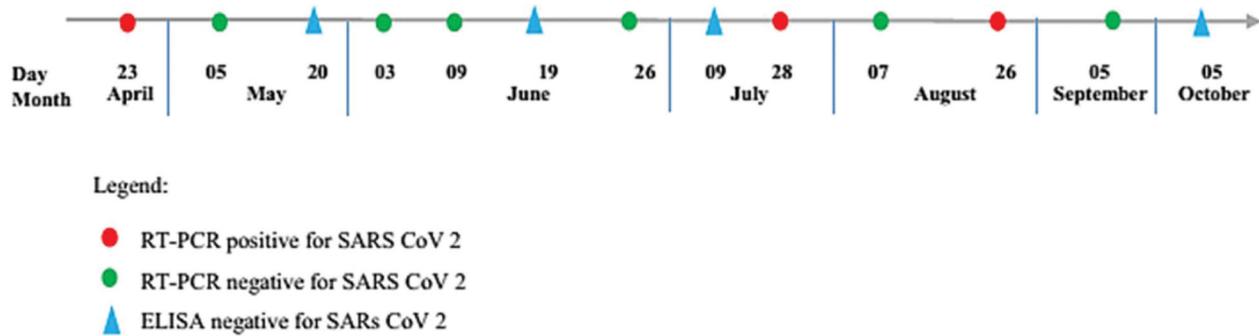


Figure 1. Timeline of SARS CoV 2 RNA investigation and serology from April to October.

confirmed COVID-19 episodes and were kept in isolation at home, although person-to-person transmission was not elucidated.

As limitations, this study was based on a single case and a detailed clinical investigation was not carried out, as the infection followed a benign course. Close family members were not tested for a possible transmission chain as well. Sample collection variations and even false negative/positive RT-PCR results should be also considered, given the high sensitivity of molecular tests. In conclusion, intermittent SARS CoV 2 shedding seems not an unusual event, being potentially underestimated in cross-sectional studies. Although isolation of positive individuals is sanctioned worldwide regardless of viral titres [10], and as noted by Qian et al. [1] discharged patients should be maintained isolated, the transmission capacity of individuals with low viral excretion (around Ct <40) should be further investigated, given its impact on health services, absence from work and socialisation.

Ethical approval

The study was approved by the University Hospital Ethical Committee of the Fluminense Federal University (register 30926020.2.0000.5243).

Disclosure statement

No potential conflict of interest was reported by the author(s).

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References

- [1] Qian G-Q, Chen X-Q, Lv D-F, et al. Duration of SARS-CoV-2 viral shedding during COVID-19 infection. *Infect Dis (London)*. 2020;52(7):511–512.
- [2] Li W, Su YY, Zhi SS, et al. Virus shedding dynamics in asymptomatic and mildly symptomatic patients infected with SARS-CoV-2. *Clin Microbiol Infect*. 2020;S1198-743X(20):30410–30419.
- [3] Lee PH, Tay WC, Sutjipto S, et al. Associations of viral ribonucleic acid (RNA) shedding patterns with clinical illness and immune responses in Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) infection. *Clin Transl Immunol*. 2020;9(7):e1160.
- [4] Walsh KA, Jordan K, Clyne B, et al. SARS-CoV-2 detection, viral load and infectivity over the course of an infection. *J Infect*. 2020;81(3):357–371.
- [5] Lin YC, Cheng CY, Chen CP, Cheng SH, et al. A case of transient existence of SARS-CoV-2 RNA in the respiratory tract with the absence of anti-SARS-CoV-2 antibody response. *Int J Infect Dis*. 2020;96:464–466.
- [6] Alonso FOM, Sabino BD, Guimarães MAAM, et al. Recurrence of SARS-CoV-2 infection with a more severe case after mild COVID-19, reversion of RT-qPCR for positive and late antibody response: case report. *J Med Virol*. 2020. DOI:10.1002/jmv.26432
- [7] Kang H, Wang Y, Tong Z, et al. Retest positive for SARS-CoV-2 RNA of 'recovered' patients with COVID-19: persistence, sampling issues, or re-infection? *J Med Virol*. 2020; 92(11):2263–2265.
- [8] La Scola B, Le Bideau M, Andreani J, et al. Viral RNA load as determined by cell culture as a management tool for discharge of SARS-CoV-2 patients from infectious disease wards. *Eur J Clin Microbiol Infect Dis*. 2020;39(6): 1059–1061.

- [9] Muhammad SA, Pui Lin C, Rosmonaliza A, et al. Post discharge positive re-tests in COVID-19: common but clinically non-significant. *Infect Dis.* 2020;52(10):743–745.
- [10] Tom MR, Mina MJ. To interpret the SARS-CoV-2 test, consider the cycle threshold value. *Clin Infect Dis.* 2020.DOI:10.1093/cid/ciaa619

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