

## IS IT POSSIBLE TO GET COVID INFECTION 3 TIMES? CASE REPORT

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### ABSTRACT

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Rare cases of suspected COVID-19 reactivation have been reported. Reactivation is defined by two positive real-time RT-PCR results for the SARS-CoV-2 virus, with an interval equal to or greater than 90 days between two episodes of COVID-19. A nurse, started with COVID-19 symptoms in July 2020 and a RT-PCR SARS-CoV-2 confirmed the diagnosis. In November 2020, more than 4 months later, she developed a new episode of COVID-19 confirmed by a second RT-PCR SARS-CoV-2. The patient received a first dose of CoronaVac – (Sinovac/Butantan) in January 2021 and a second dose in February 2021, but 30 days after a third episode was confirmed. Contrary to what happens with many infectious diseases which generate antibodies and protect people from future episodes, this aspect is still not clear in relation to COVID-19. In addition to vaccination, the use of Personal Protective Equipment is essential for healthcare workers.

**Keywords:** COVID-19; SARS-CoV-2; Reinfection

### INTRODUCTION

Coronavirus 2019 disease (COVID-19) carries several challenging problems, including the onset of insidious symptoms, subclinical manifestations and the fact that it is highly transmissible during its early stage<sup>1</sup>.

However, rare cases of suspected “recurrence” or reactivation of COVID-19 have been reported<sup>2,3</sup>.

The criteria that define a suspected case of reinfection follow Technical Note Number 52/2020 of the Ministry of Health<sup>4</sup>: “Individuals with two positive real-time RT-PCR results for the SARS-CoV-2 virus, with an interval equal to or greater than 90 days between the two episodes of respiratory infection, regardless of the clinical condition observed in the two episodes.”

### Objective

This paper aims to report a suspected case of reinfection by COVID-19 on 3 occasions in a healthcare worker at a university hospital.

### CASE REPORT

A nurse, started with symptoms in July 2020 as: headache, myalgia, fever, sore throat. Reported no contact with confirmed cases of COVID. She works at two different hospitals serving COVID patients, but always using personal protective equipment (PPE). She was accompanied at the hospital’s occupational medicine service and had a nasal swab scheduled for the 5th day after the onset of symptoms, which were dry cough, anosmia, ageusia, sweating, myalgia and headache. The result of RT-PCR SARS-CoV-2 was detected. On the 14th day she still persisted with cough and sore throat and was kept away. Afterwards, she presented good clinical evolution and was discharged from outpatient follow-up completely asymptomatic. In November 2020, more than 4 months later, she developed a headache, runny nose, myalgia, sore throat, nasal obstruction, cough, fatigue, tiredness, nausea and

vomiting. She reported contact with a COVID positive friend, without PPE, about 14 days ago. She was instructed to recollect RT-PCR SARS-CoV-2, which was detected. On this occasion, a search for IgM and IgG antibodies to SARS-CoV-2 was also performed, the result of which was IgM 8.24 (reactive) and IgG 0.5 (non-reactive). She had a good clinical evolution and was discharged from the outpatient clinic 10 days after. Four months later the second diagnosis, she presented intense headache, myalgia, fever of 37.8 (which subsided with antipyretic), sore throat, cough, asthenia, and back pain and RT-PCR SARS-CoV-2 result was detected again. Serology for SARS-CoV-2 was again requested, and the result was: IgM 0.31 (non-reactive) and IgG (3.45) reagent. The Viral Panel was also requested, which included the search for: Influenza A subtypes H1N1 and H3N2, Influenza B, metapneumovirus, respiratory syncytial virus subtype A and B, Parainfluenza subtypes 1,2,3 and 4, Rhinovirus, Adenovirus, Bocavirus, Enterovirus, SARS-CoV-2, Coronavirus 229E, Coronavirus HKU-1, Coronavirus NL63, Coronavirus OC43, Bordetella pertussis, Bordetella parapertussis and Mycoplasma Pneumoniae, all not detected. She used antibiotic for suspected pneumonia and on the 5th day she no longer had fever, the chest tomography was normal. She presented good evolution. The patient had received 2 doses of CoronaVac – (Sinovac/ Butantan) in January 2021 and the second dose in February 2021. The third episode of suspected COVID symptoms started about 30 days after the second dose of COVID vaccine. The RT-PCR analysis of all samples was requested with the calculation of their cycles (CTs). The CTs of the three exams were: July 2020: 16.85 and 17.84; November 2020: 17.97 and

19.23; March 2021: CTs 35.17 and 35.18. Discussion: CT corresponds to the number of PCR cycles needed to start amplification. A CT less than 35 has been considered a detected virus, and greater than 40 has been considered a virus not detected. Between 35 and 40, confirmation is required. Although CTs are elevated, it is not possible to rule out the third episode of COVID-19 infection. Regarding the technique used to collect material for the 3 exams, it was exactly the same. Appropriate collection methods have been discussed by Petruzzi et al.<sup>5</sup> where it is suggested to perform a nasopharyngeal smear sampling.

## DISCUSSION

Unfortunately, genomic analysis was not available in hospital. Without genomic analysis it is difficult to confirm the evidence a variety of strains for COVID-19 in this case<sup>6</sup>. The literature report that the COVID-19 immune response is variable and patient-specific with respect to the development of antibodies and to antibody persistence in serum over time. Therefore, the evidence is still inadequate and more research is needed<sup>7</sup>. As more research about reinfection arise to better understand the mechanisms that drive it in we understand how reduce reinfection worldwide<sup>8</sup>. Contrary to what happens with many infectious diseases which generate antibodies and protect people from future episodes, this aspect is still not clear in relation to COVID-19. In addition to vaccination, the use of Personal Protective Equipment is essential for healthcare workers, even for those who have already had this disease.

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