

COVID-19 reinfection in a healthcare worker

Dear Editor,

The paper by Kang et al.¹ that has been recently published in your journal evaluated a very important topic for the management of COVID-19 infection as the clinical meaning of being retested positive in subjects recovered from COVID-19 pneumonia. In particular, it still remains unclear the risk of convalescing patients to have reinfection by COVID-19; at the very beginning of the pandemic, a study on SARS-CoV-2 infected monkeys seemed to rule out the risk of reinfection.² Nevertheless, some other case series in humans suggested a very reliable possibility of reinfection.^{3–5} As a consequence, at the moment there are not enough data to definitively settle the question. We describe here the case of a nurse with positive reverse transcription-polymerase chain reaction (RT-PCR) and serological tests, followed-up by four consecutive negative nasopharyngeal swabs who, after another exposure to COVID-19, presented another RT-PCR test positive and had a significant increase of antibody anti-SARS-CoV-2 titer.

A 48-year-old nurse underwent to nasopharyngeal swab RNA test for SARS-CoV-2 at March 9 for the development of a dry cough and mild fever, without other signs of respiratory failure (arterial oxygen saturation was 99% and breath frequency was 15/min). She had not any chronic disease and did not receive any chronic medication at that time. The nasopharyngeal swab test was positive and, according to World Health Organization guidelines, the patient was quarantined. Nasopharyngeal tests got negative (two consecutive negative tests repeated after 24–48 h from each other) on March 31; a serological test was also performed and showed an antibody titer of 48 Au/ml (normal values < 12 Au/ml). A serological test was performed using the LIASON[®] SARS-CoV-2 S1/S2 IgG test that provides a quantitative assay for the detection of immunoglobulin G antibodies against S1/S2 antigens of SARS-CoV2.

On April 20 and 22, the patient was tested again because she was hired in another hospital. Nasopharyngeal swabs were still negative and the serological test showed an antibody titer of 30 Au/ml. At June 29 she was exposed to SARS-CoV-2 for caring for a patient who accidentally discovered to be positive (this patient was admitted to Emergency Department for lipothymia and had never had respiratory or gastrointestinal symptoms or fever or anosmia/dysgeusia). A nasopharyngeal swab was then repeated and resulted positive; as a consequence, she was forced to another quarantine period. At that moment, she was completely asymptomatic. Nasopharyngeal swab tests got negative on July 30 and August 1; on July 30 a serological test was repeated and showed an antibody titer of 102.9 Au/ml, suggesting possible reinfection rather than a recurrence or persistence of COVID-19 infection due to viral shedding.

A the moment, nasopharyngeal swab RT-PCR remains the gold standard to diagnose and manage COVID-19 infection. However, an amount of false-negative results have been reported, mainly due to sampling procedures, sources of samples, and the sensitivity/specificity of the nucleic acid test kit.⁶ As a consequence, when asymptomatic subjects are tested it is extremely difficult to discriminate between recurrence of COVID-19 infection or intermittent shedding of RNA fragments or new-onset infections. In particular, it could be possible that recurrences should be persistent infections in which nasopharyngeal swab resulted falsely negative at discharge, and that truly negative patients suffered reactivation or are reinfected with another COVID-19 strain, especially if comorbidities are present.³ In the case we present, the patient maintained always clinically asymptomatic and has been repeatedly tested for COVID-19 infection only because she is a healthcare worker. In this specific case, the significant increase of antibody titer when she was discovered to be COVID-19 infected for the second time makes the possibility of reinfection plausible. This finding may suggest that periodic evaluation of the antibody titer could be useful in the management of COVID-19 infection, especially in high-risk subjects as the healthcare workers.

Marco Bongiovanni 

*Internal Medicine Unit, Department of Medicine,
Ospedale di Circolo di Rho, ASST Rhodense, Milan, Italy*

Correspondence

Marco Bongiovanni, Internal Medicine Unit, Department of Medicine, Ospedale di Circolo di Rho, ASST Rhodense, Milan, Italy.
Email: mbongiovanni@asst-rhodense.it

KEYWORDS

coronavirus, immune responses, infection, reinfection, virus classification

ORCID

Marco Bongiovanni  <https://orcid.org/0000-0003-2999-3707>

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