

## Recurrent Positive Case of SARS COV 2 RNA Detection in A Medical Staff Recovered from COVID 19 (Coronavirus Disease 2019)

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### ABSTRACT

Now, thankfully and due to many scientists' efforts, the diagnosis of COVID 19 (Sars-Cov-2 disease) is becoming much easier to certify. However, the temporal dynamics of viral excretion and infectiousness of COVID-19 remains less understood. In this publication, we report a case of COVID-19 in which, despite the presence of anti SARS-Cov-2 IgG antibodies and the clinical recovery, SARS-Cov-2 ribonucleic acid (RNA) has persisted in throat/nasal swab over 68 days after disease onset. This case highlights, first, the possibility of the persistence of Sarscov 2 virus with a low viral load in a small proportion of the population, even after recovery. Then, the infectivity of this persistent virus residue is very low when CT values are high and exceed about 8 to 10 days since the onset of symptoms. However, given the lack of certainty about the duration of immunity, we must remain vigilant and keep close surveillance, so that we can stay alert regarding the possibility of real cases of re-infection occurring.

**Keywords:** COVID-19, SARS-CoV-2, Infectivity, RT-PCR, Viral Load Kinetics

### INTRODUCTION

Sarscov 2 (RNA virus) is the causative agent of COVID 19 (coronavirus disease 2019). A disease that emerged in Wuhan, China, in December 2019 and which rapidly spread worldwide, paralyzing several countries until today [1-3]. Thankfully, and due to many scientists' efforts, the diagnosis of the disease is becoming much easier to certify. In fact, a set of clinical arguments, specifically radiological and biological ones, help nowadays to make a rapid diagnosis [4]. However, the temporal dynamics of viral excretion and infectiousness of COVID-19 remains less understood. Nevertheless, it has been reported that the start of infectiousness may begin 2 to 3 days before the appearance of the symptoms and decreases after symptom onset [5]. Also, the median range of viral shedding has been reported to be 11-20 days after the onset of symptoms [2,6].

In this publication, we report a case of COVID-19 in which, despite the presence of anti SARS-Cov-2 IgG antibodies and the clinical recovery, SARS-Cov-2 ribonucleic acid (RNA) has persisted in throat/nasal swab over 68 days after disease onset.

### CASE PRESENTATION

On May 04, 2020, 43-year-old woman, intensivist and working in COVID-19 special unit at Mustapha University hospital center (Algiers, Algeria) manifested fever (38.5°C), dry cough, myalgia, anosmia, moderate diarrhea and dyspnea. Lung CT was performed immediately, resulting on images reporting multiple patchy ground-glass opacities in the two

lungs (15 % of the lung tissues were involved). The oxygen saturation was at 92% while the patient was breathing ambient air. Blood routine tests, liver function, renal function, and D-dimer's levels were disturbed.

Virology lab at the same hospital confirmed that the patient's oropharyngeal swab test of SARS-CoV-2 by qualitative real-time reverse-transcriptase-polymerase-chain-reaction (RT-PCR) assay was positive. Given all these findings she was confirmed as a COVID-19 patient.

Soon after, she got treated by Hydroxychloroquine, antibiotics (Azithromycine), Zinc, Vit C, Vit D and low molecular weight heparin (LMWH).

Even though the patient has been symptom free since the first week after onset, she has been isolated continuously at home, due to recurrent positive SARS-CoV-2 RNA test results. In fact, Oropharyngeal swab tests of SARS- CoV-2 RNA were performed repeatedly for surveillance. Exceptionally, she tested positive for SARS-CoV-2 RNA on specimens collected from throat or nasal swabs on days 10, 24, 42, 56, 64 and 68

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and the result became negative on day 72.

The dynamics of lung CT Scan revealed that, the patchy infiltration of both lungs had almost disappeared on day 69. At the same time, the oxygen saturation increased from 92 to 95 % while the patient was breathing ambient air. On day 42, the patient's blood routines, liver and kidney functions returned to normal ranges. Notably, SARS-CoV-2 IgG antibody showed positive on 72 days from disease onset.

## DISCUSSION

Epidemiological surveys indicated that Respiratory droplets and contact are considered as the main routes of transmission of Sars-cov2. So, COVID-19 patients currently remain the primary source of infection [7]. Treatment and quarantine of the confirmed patients are critically important, especially for medical staff because they can infect a large number of people. Follow up of virus' shedding, using sensitive techniques, also remains important because people with positive SARS-CoV-2 RNA by respiratory tract specimens are probably an infectious source of COVID-19 [8]. According to the guideline of our hospital, Medical staff should be isolated until the SARS-CoV-2 RNA test of respiratory tract specimen becomes negative, with a positive anti-SARS-CoV-2 IgM/IgG antibody.

In this article, we report a case of an intensivist, working in the special COVID 19 Unit, with whom results of the SARS-CoV-2 RNA tests remained positive for a long period, even after clinical remission and positive serological tests (anti-SARS-CoV-2 IgG antibody).

In fact, the oropharyngeal swab test for SARS-CoV-2 RNA was still positive after 68 days, while her symptoms had already improved. Due to her proximity with patients, this aroused our great concern regarding her potential infectivity and transmitting the virus to other patients, especially because she was asymptomatic with positive virus detection after her discharge. From what we knew, it was difficult to find a reasonable explanation for these observations.

First, the case we are reporting suggests that the SARS-CoV-2 virus can coexist with patients for a long period, although those developing an immune response. As a reminder, in this case, the IgG antibodies against SARS-CoV-2 were positive 38 days after the onset of the disease; unfortunately, the patient was nevertheless detected as a carrier of the virus. Since the start of the pandemic, it turns out that some similar cases have already been described. Accordingly, several cases of positive RT-PCR results after recovery have been reported in asymptomatic people, and this, after being declared recovered [9-11]. So far, the majority have had low viral load levels [11].

Indeed, this publication illustrates a possibility of small proportion of clinically recovered patients with positive IgG against Sars-Cov-2 who may still carry a minor part of the virus [9-10] and it may still take some extra days to the

immune system to completely eliminate the residual viruses in the body [7]. During this period, the virus may be detected and tested positive, even if the patients are asymptomatic. But according to a public health report Ontario, Canada, positive results after recovery are due to the shedding of non-viable virus fragments without risk of transmission. In other words, the minor proportion of recovered patients, with positive virus detection after discharge, does not necessarily mean the patient is infectious [11].

In fact, even if RT-PCR is at the same time, fast and highly sensitive for the diagnosis of COVID 19, it does not provide information on the viability of the viruses excreted [12]. It is well known from other viruses that viral RNA can persist beyond infectivity [13-14]. So, demonstration of in vitro infectiousness on cell lines is a better surrogate of viral transmission, but its use for diagnosis is hampered by its difficult nature [12]. Wölfel R and al reported that no virus could be recovered beyond 7 days post symptom onset, in a cohort study of nine patients [15].

Another Canadian study presented viral culture results on a larger group (90 patients), compared to PCR data and time of symptom onset SARS-CoV-2 Vero cell infectivity was only observed for RT-PCR Ct<24 and duration of symptoms <8 days [12].

The same study suggests if the qualitative reporting of results of SARS-CoV-2 RT-PCR as positive or negative is sufficient for the diagnosis, it may be supplemented by Ct values, as well as time of symptoms onset for a more effective follow up [12].

In addition to the Ct value and the duration of infection, the positivity of anti SARS-Cov-2 antibodies is also important for the follow up and consequently, avoiding long period of unnecessary long period of quarantine once Ct is low in recovered patients [16].

## CONCLUSION

Taking into account the elements of this clinical case and the analysis of the literature. Several ideas deserve to be highlighted: First, the possibility of the persistence of Sarscov 2 virus with a low viral load in a small proportion of the population, even after clinical recovery. Then, the infectivity of this persistent virus residue is very low when CT values are high and exceed about 8 to 10 days since the onset of symptoms. This can help in reducing unnecessary long isolation periods, especially among healthcare workers during this crisis [9-12].

However, given the lack of certainty about the duration of immunity, we must remain vigilant and keeping close surveillance, mainly for medical staff so that we can stay alert regarding the possibility of real cases of re infection occurring [11].

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