

# Selective Transmission In SARS-CoV-2: An Interesting Covid-19 Case Report

## SARS-CoV-2'nin Seçici Bulaşı: ilginç Bir Covid-19 Vaka Sunumu

İsmet ÇELEBİ<sup>1</sup>

<sup>1</sup>Lecturer, Gazi University, Department of Paramedic, Ankara TURKEY [ismetcelebi@gazi.edu.tr](mailto:ismetcelebi@gazi.edu.tr)  
ORCID ID: 0000-0002-6494-2908

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### ABSTRACT

With the large number of individuals infected and recovering from COVID-19, intense debate continues about the quality and duration of acquired immunity from SARS-CoV-2 infection, including the possibility of relapse. In this study, we present three healthcare workers who share a house, two of whom simultaneously developed COVID-19 infection whereas the third tested negative for COVID-19.

Keywords: COVID-19, Paramedic, repeat infection, Health Workers

### ÖZET

Covid-19'dan enfekte olan ve iyileşen çok sayıda bireyle birlikte, SARS-CoV-2 enfeksiyonunun sağladığı bağışıklığın kalitesi ve süresi hakkında, hastalığın tekrarlama olasılığı da dahil olmak üzere yoğun tartışmalar sürmektedir. Bu çalışma ile aynı evde yaşayan üç sağlık çalışanından ikisinin aynı anda COVID-19 enfeksiyonuna yakalanmasına rağmen birinin negatif olması ile ilgili bir vaka sunulmaktadır.

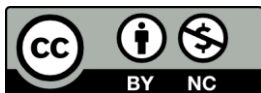
Anahtar kelimeler: COVID-19, Paramedik, Tekrarlama, Sağlık Çalışanları

## INTRODUCTION

An outbreak of the novel coronavirus (COVID-19) was first reported in Wuhan, China in late December 2019, and was declared a pandemic by the WHO on March 11 (WHO, 2020). As of 22 November 2020, there have been over 57.8 million reported cases and 1.3 million reported deaths globally (Alonso vd., 2020). As the world searches for solutions to this global public health problem, another fact emerged: studies have reported the recurrence of COVID-19 infection in previously

infected individuals (Wu vd., 2020; Chen vd., 2020; Kang vd., 2020; Bonifacio vd., 2020). To the best of our knowledge, there are no reported cases that describe recurrent COVID-19 infection and COVID-19 non-infection in the same household.

In this study, we present three medical staff sharing a household, two of whom tested positive for COVID-19 twice, two months apart, and a third who tested negative during each COVID-19 infection in the household.



## CASE REPORT

The first patient was a 22-year-old (women) nurse who worked in a COVID-19 intensive care unit. The patient did not have a history of chronic diseases. She vaccinations were up-to-date and in line with the national vaccination schedule, and they did not use alcohol, cigarettes, or drugs. Our patient underwent PCR testing for COVID-19 on 15 August 2020 due to contact with a COVID-19-positive colleague, which came back positive. The patient only described nasal congestion and fatigue. Approximately two months after recovery, the patient underwent PCR testing a second time, again due to contact with COVID-19-positive colleagues. The patient tested positive in PCR screening for the second time on 18 October 2020. This time, the patient reported back pain, fatigue, and widespread pain.

The second patient was a 22-year-old (women) paramedic working in a private ambulance service who shared a household with the first patient. The patient's history included allergic asthma and gastritis. She vaccinations were up-to-date and in line with the national vaccination schedule, and she did not use alcohol, cigarettes, or drugs. The second patient underwent PCR testing due to contact with a COVID-19-positive individual (i.e. the first patient) and tested positive for COVID-19 on 16 August 2020. The patient had no symptoms during the time

of infection and only had throat and lower back pain three days after the positive PCR test, and developed sleepiness, fatigue, and palpitations after receiving treatment. The second patient was tested for COVID-19 again after the reinfection of their housemate, and the result came back positive a second time on 19 October 2020. This time, the patient described severe headache, low back pain, joint pain, fever (38.5 °C), nausea, dizziness, diarrhea, and abdominal pain. They lost the sense of taste and smell starting from the third day. Both cases were negative in the PCR test performed 10 days after the treatment.

The third person who lived in the same house was a 22-year-old (women) nurse. The patient did not have a history of chronic diseases. She vaccinations were up-to-date and in line with the national vaccination schedule, and she did not use alcohol, cigarettes, or drugs. She was PCR negative for COVID-19 during both infections in the household.

The only shared trait of the two COVID-19-positive patients was sharing a bedroom (appx. 12 m<sup>2</sup>). The COVID-19 patients used individual beds, and all three housemates shared common areas (bathroom, kitchen, living room, etc.) without social distancing or using masks. They reported eating and drinking tea and coffee together.

## DISCUSSION

The COVID-19 epidemic is a global threat and was declared a pandemic by the WHO. The global risk assessment of the infection was evaluated as “very high”, possibly due to rapid human-to-human transmission (Bonifacio vd., 2020).

The first subject of this discussion is the recurrence of COVID-19 infection. Different reports have shown that reactivation or re-infection with SARS-CoV-2 is possible (Chen vd.,2020; Kang vd.,2020; Bonifacio vd., 2020). Patients who tested positive a



second time after an initial infection usually had mild disease or were asymptomatic, which was ascribed to acquired immunity (Cao vd., 2020). In our case report, the second infection was more severe than the first. Our finding is consistent with other case reports that indicate a more severe second COVID-19 episode (Alonso vd., 2020). This may be because the initial mild infection was insufficient to generate humoral response.

The literature reports COVID-19 reinfection, as determined by RT-PCR, immediately or up to 49 days after the initial RT-PCR positivity (Chen vd., 2020; Cao vd., 2020). In our study, patients were PCR positive 65 days after the first infection. This may be ascribed to a longer asymptomatic period than what is described in the literature, or due to contracting the virus a second time.

The possibility of a reactivation of COVID-19 poses a major public health concern since it could significantly contribute to the spread of the virus in the population. Domiciliary quarantine of 14 days applies to all COVID-19 patients after hospital discharge, but a clear definition of the

infectiousness timing and duration of viral shedding is still lacking (Lombardi vd.,2020). Pre-symptomatic and asymptomatic carriers may be infectious, but we should consider that also the convalescent may transmit the virus (Loconsole vd.,2020).

The second subject of discussion is non-infection in the third subject who also worked in a hospital and shared a household with two COVID-19 patients. Nishiura et al. (2020) concluded that a person infected with COVID-19 is 18.7 times more likely to infect others indoors than outdoors (Nishiura vd., 2020). That said, it is curious that two out of three people who share a household and common areas of a house developed an infection, while the third did not. This brings to mind that COVID-19 may be more infectious in closed spaces of smaller size.

Another possibility may be that the immune system of the person not infected with the disease is stronger. Another possibility is that our two patients were simultaneously exposed to infection from different places. However, this situation is thought to be very unlikely.

## CONCLUSION

This case report has two particularities: Firstly, COVID-19 patients can be re-infected even months after the first infection. Secondly, the size of the isolation space is prominent. This case report provides strong evidence that SARS-CoV-2 re-infection and COVID-19 relapse are possible, albeit

rare. This possibility should be further investigated in patients presenting with recurrence of COVID-19 symptoms. The study was limited to a small number of participants. Longer-term follow-up of more patients is required to better understand the progression and spread of the disease.

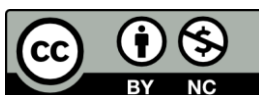
## ETHICAL APPROVAL

Informed consent was obtained from the patients for the publication of this case report.

## ACKNOWLEDGMENTS

We thank the patient who was quoted in the case who kindly provided all the required information

and made himself available for cooperation in this research.



## CONFLICT OF INTERESTS

The author declares that there are no conflicts of interests.

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