

### **COVID-19 Reinfection in a nurse working in emergency hospital in Duhok city, Kurdistan region of Iraq**

#### **Abstract**

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus responsible for coronavirus disease (COVID-19), was first discovered in Wuhan, China. The question of whether COVID-19 patients that recovered from the disease acquire immunity or are still susceptible to reinfection is unanswered. In this report, we present a case of a covid-19 reinfection in patient who had recovered from an initial infection.

#### **Case report**

41-year-old male, nurse working in emergency hospital, presented in August 2020 with two days history of frequent fever, sore throat, myalgia, lower back pain, shortness of breath. Then, his oxygen saturation dropped to 80% and the patient was admitted to hospital. COVID-19 infection was proved by with a positive RT-PCR for SARS-cov-2 test and CT scan of the chest demonstrated bilateral ground glass opacities. After treatment, he demonstrated clinical improvement and was discharged from hospital. On 26th of October, he developed fever, and fatiguability. RT-PCR for SARS-cov-2 resulted as positive twice. The infection was mild and no specific treatment was administered to the patient during the second infection. On 6th of November, the patient was asymptomatic. On 7-8<sup>th</sup> of November, he consecutively tested negative for SARS-CoV-2 twice.

#### **Conclusions**

Mild SARS-CoV-2 reinfection may occur rarely due to repeated exposure to the virus in hospital setting. If the occurrence of reinfections is demonstrated to be true, it may change the strategy of community-based disease prevention. Further studies are needed to confirm the possibility of COVID-19 reinfection.

**Key Words:** Reinfection, Covid-19, SARS-CoV-2, Duhok, Iraq

## **Introduction**

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was discovered in December 2019 in Wuhan City, China. When the evidence of human-to-human transmission of SARS-CoV-2 emerged, concerns regarding the transmission of the virus from infected individuals to healthcare workers (HCWs) were inevitable, and many reports around the world supported this concern. Patients with COVID-19 are considered non-infectious after the resolution of symptoms and two successive negative real-time reverse-transcription polymerase chain reaction (RT-PCR) test results performed 24 hours apart. However, reinfection may be possible after recent reports showing recovered patients testing positive after a symptom-free period (1-3). Early reports focused on the risk of transmission of SARS-CoV-2 to HCWs and their safety and suggested that HCWs were at an increased risk of infection and that when infection occurred, it would be more severe (4). Herein, we describe a case of SARS-CoV-2 reinfection in a nurse working in an emergency hospital in Duhok city, Kurdistan region of Iraq.

## Case report

41-year-old male, nurse working in surgery ER, presented on 5<sup>th</sup> of August with two days history of frequent fever, sore throat, myalgia, lower back pain, shortness of breath. He was hemodynamically stable and not hypoxic (SpO<sub>2</sub>: 95% without oxygen), on 6<sup>th</sup> of August the RT-PCR for SARs-cov-2 resulted as positive in two consecutive days. Then, his oxygen saturation dropped to 80% and the patient was admitted to hospital. Physical examination on admission showed the followings: hear rate: 110 B/min; respiratory rate: 21 breaths/min; blood pressure: 125/70 mmHg. Other blood tests showed the following: hemoglobin level, 14.5 g/dL; white blood cell count,  $14.6 \times 10^9/L$ ; platelet count,  $254 \times 10^9/L$ ; C-reactive protein level, 109 mg/L; d dimer, 852 ng/ml. CT scan of the chest demonstrated bilateral ground glass opacities (Figure 1). The patient was treated with Favipiravir tablet 200mg, 8 tablets twice daily on the first day, then 3 tablets twice daily for four days plus dexamethasone 6 mg IV. He demonstrated clinical improvement 10 days after his condition started. On 15 of August the RT-PCR for SARs-cov-2 resulted as negative in two consecutive days. On 26<sup>th</sup> of October, he developed fever, sore throat, and fatiguability. On examination, he was hemodynamically stable and not hypoxic (spo<sub>2</sub>:97% without oxygen). RT-PCR for SARs-cov-2 resulted as positive twice. Other blood tests showed the following: hemoglobin level, 13.7 g/dL; white blood cell count,  $6.7 \times 10^9/L$ ; platelet count,  $302 \times 10^9/L$ ; C-reactive protein level, 5.7 mg/L; d dimer, 312 ng/ml. No specific treatment was administered to the patient during the second infection. On 6<sup>th</sup> of November, the patient was asymptomatic. On 7-8<sup>th</sup> of November, he consecutively tested negative for SARS-CoV-2 twice.

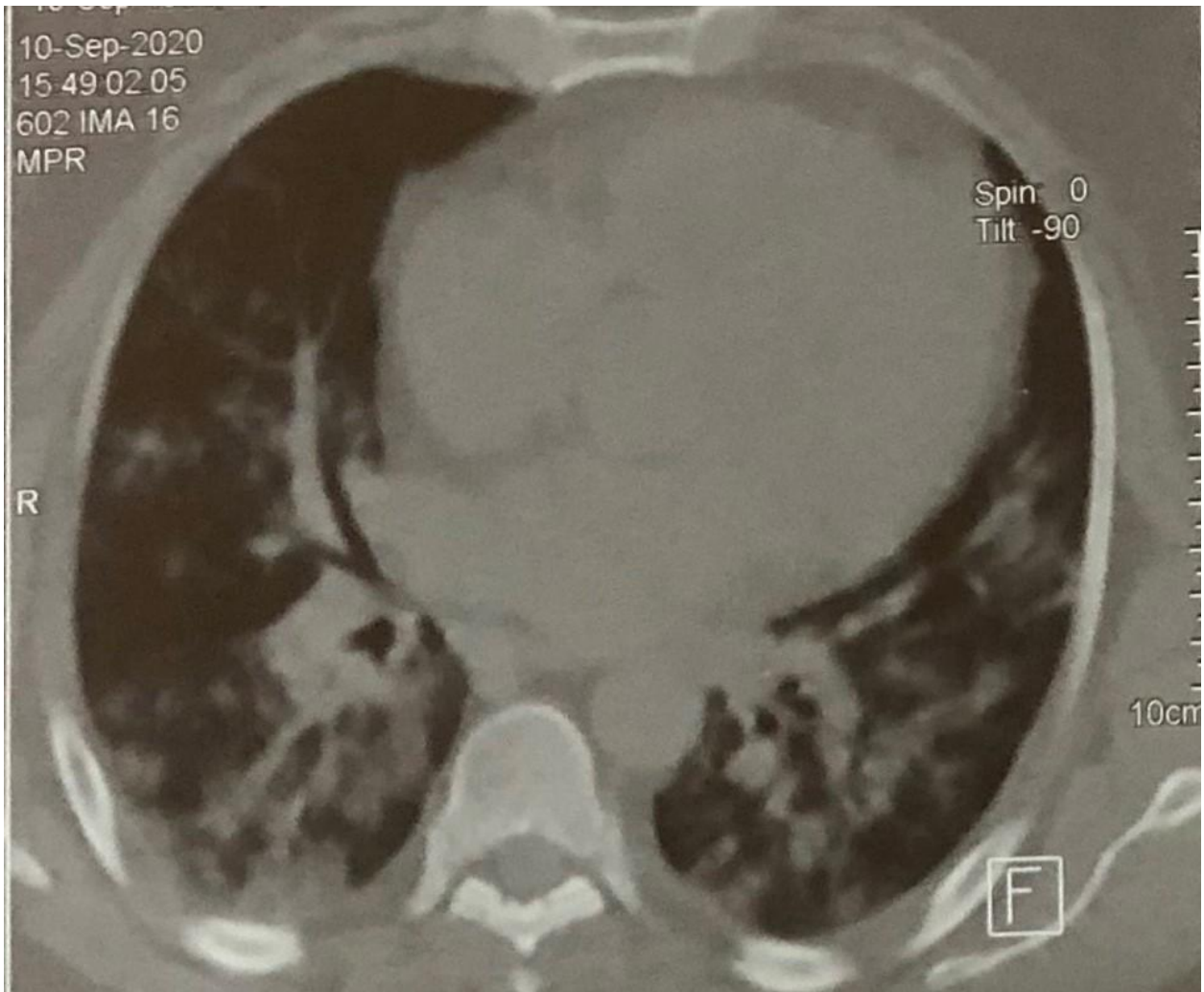


Figure 1. CT Scan of the chest showing peripheral multifocal and bilateral ground glass pattern.

## Discussion

Previous reports showed that during the first three months of the pandemic HCWs were three times more likely to get severe infection and admitted with covid-19 (5). In this report, we report the first case of reinfection occurring in HCWs in Iraq. Our case patient was first diagnosed in August 2020. At the time, a government-imposed regulation required that all patients who tested positive in RT-PCR exams must be admitted to COVID-19 centers regardless of symptom presence (6, 7). Subsequently, his respiratory status declined (SpO<sub>2</sub>: 80%) and he was treated as severe COVID-19 case. After 12 days, our patient demonstrated clinical improvement and he was discharged after two subsequent negative RT-PCR test results for SARS-CoV-2. He remained without symptoms until the 26<sup>th</sup> of October, when he reported fever and myalgia and he was tested positive by RT-PCR. The second infection was mild and did not need specific treatment. In agreement with cases reported in Belgium, the Netherlands (3), and Hong Kong (2), the reinfection presented with milder symptoms. The mild infection in the second round could be explained by the primed immune system following primary infection. The reinfection in our case could be due to repeated exposed to the virus in hospital setting. In our case, the long period of negativity (73 days) makes it unlikely that the reinfection was caused by the SARS-CoV-2 dynamic profile. In accordance with our study, in a study assessing of the risk of SARS-CoV-2 reinfection in an intense re-exposure setting, it was found that reinfection can occur occasionally (8). The concept of reinfection, if proven, has implication on the role of herd immunity and render this strategy ineffective. Furthermore, reinfection with

different virus genotypes may impact vaccine efficacy and different genotypes should be considered in vaccines.

#### Conclusion

To conclude, mild SARS-CoV-2 reinfection may occur rarely due to repeated exposure to the virus in hospital setting. This suggests a protective immunity against reinfection that may last for months post primary infection. Reinfection concept, if proven, may implicate prevention strategies including vaccination.

UNDER PEER REVIEW

## References

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