

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

Abstract

Novel coronavirus disease (COVID-19) or SARS-CoV-2 infection was discovered in December 2019 in Wuhan City, China. The infection became a global pandemic over a period of few months. Post-infection immunity and susceptibility for reinfection is still under investigation. 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%. COVID-19 infection was **proved by a positive RT-PCR for SARS-CoV-2** and CT scan of the chest demonstrated bilateral ground glass opacities. After clinical improvement, the patient 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 7-8th of November, he consecutively tested negative for SARS-CoV-2 twice.

Conclusions

Mild SARS-CoV-2 reinfection may occur rarely due to repeated exposed to the virus in hospital setting. If the occurrence of reinfections is demonstrated to be true, it may change the strategy

of infection prevention. Further studies are needed to confirm the possibility of COVID-19 reinfection.

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

Introduction

Novel coronavirus disease (COVID-19) or SARS-CoV-2infection was discovered in December 2019 in Wuhan City, China. The infection became a global pandemic over a period of few months (1). 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. Subjects with COVID-19 can be non-infectious after the resolution of symptoms and two successive negative nasopharyngeal swab test results were performed 24 hours apart. nevertheless, recent reports showed that reinfection is possible after a symptom-free period (2-4). 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 (5). Herein, we describe a case of SARS-CoV-2 reinfection in nurse working in emergency hospital in Duhok city, Kurdistan region of Iraq.

Case report

41-year-old male, nurse working in surgery ER, presented on 5th 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 (SpO₂:95% without oxygen), on 6th 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: heart 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 (Fig. 1). The treatment regimen included Favipiravir tablet 200mg, 8tablets twice daily on the first day, then 3tablets 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 nasopharyngeal swab resulted as negative in two consecutive days. On 26th of October, he developed fever, sore throat, and fatiguability. On examination, he was hemodynamically stable and not hypoxic (spo₂:97% 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 6th of November, the patient was asymptomatic. On 7-8th of November, he consecutively tested negative for SARS-CoV-2 twice.

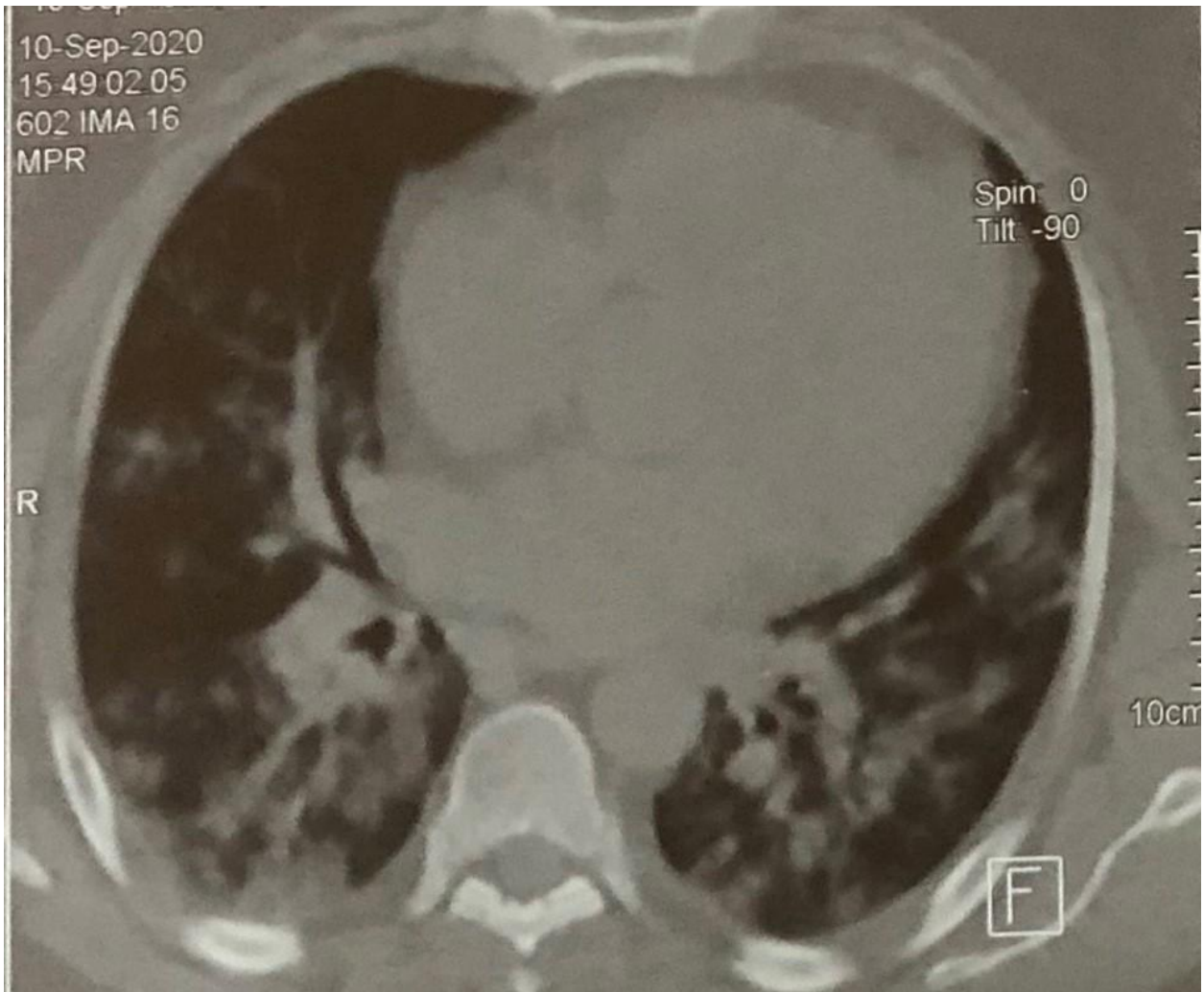


Fig. 1. CT Scan of the chest showing peripheral multifocal and bilateral ground glass pattern.

Discussion

Reinfection with SARS-CoV-2 has acquired great significance particularly after the appearance of rapidly spreading variant in the UK (6, 7). Although there is no sufficient data about the possibility of reinfection with such a variant, rapidly spreading virus has a negative impact on the healthcare services causing more hospitalization (6, 7). More studies are needed to investigate this and accelerated vaccination program is needed to reach vulnerable populations. 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 (8). In this report, we reported the first case of reinfection occurring in HCWs in Iraq. In our case, the 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(9-11). Subsequently, his respiratory status declined (SpO₂: 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 26th 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(12), and Hong Kong(13), the reinfection presented with milder symptoms period. 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 (14). 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 exposed 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.

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