

Possible COVID-19 reinfection case in Duhok City, Kurdistan: A case report

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ABSTRACT

Since the discovery of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the coronavirus disease (COVID-19) pandemic has become the most important health-care crisis globally, having spread to millions of people worldwide. Patients who recover from COVID-19 are still susceptible to reinfection. In this report, we present the case of a patient who had recovered from COVID-19. Recovery was defined as the resolution of symptoms accompanied by two consecutive SARS-CoV-2-negative real-time reverse transcriptase-polymerase chain reaction (RT-PCR) test results. Two months after the first infection, the patient tested positive for anti-SARS-CoV-2 antibodies. Three months after this test, the patient presented with mild COVID-19 symptoms that was confirmed by RT-PCR. These findings indicate a possible reinfection case. If the occurrence of reinfections is demonstrated to be true, then it may change the strategy of community-based disease prevention. More research is needed to confirm the concept of reinfection.

Keywords: COVID-19, Duhok City, Kurdistan, reinfection case

Introduction

Since the discovery of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), coronavirus disease (COVID-19) became pandemic over a period of few months^[1,2] and is the most important health-care crisis globally. Individuals with COVID-19 can be considered to be noninfectious after the resolution of symptoms and two consecutive negative real-time reverse transcriptase-polymerase chain reaction (RT-PCR) test results, performed at least 24 h apart. However, there is an increasing number of reports showing that reinfection may be possible after recovery.^[3-6] Herein, we describe a case of possible SARS-CoV-2 reinfection.

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Received: 06-12-2020

Revised: 16-02-2021

Accepted: 03-03-2021

Published: 31-05-2021

Case Report

A 39-year-old man with a hypertension history presented with persistent fever and dry cough on June 2, 2020. He was hemodynamically stable, not hypoxic (SpO₂: 96% on room air), and febrile (38.6°C). Subsequently, his respiratory status declined (SpO₂: 93%). He was treated with hydroxychloroquine (two 400 mg doses on the first day, followed by 200 mg twice a day for 5 days), azithromycin (500 mg on the first day followed by 250 mg daily for 5 days), and oxygen therapy. After 7 days, the patient demonstrated clinical improvement; on June 13, he was discharged after two subsequent negative RT-PCR test results for SARS-CoV-2. On August 15, the patient tested positive for anti-SARS-CoV-2 antibodies.

On October 2 (112 days after discharge from hospital), the patient presented with fever and sore throat. He was hemodynamically stable, not hypoxic (SpO₂: 97%), and febrile (38°C). The patient was tested for SARS-CoV-2 again twice; both results were

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How to cite this article: Hussein NR, Musa DH, Saleem ZS, Naqid IA, Ibrahim N. Possible COVID-19 reinfection case in Duhok City, Kurdistan: A case report. *J Family Med Prim Care* 2021;10:2035-7.

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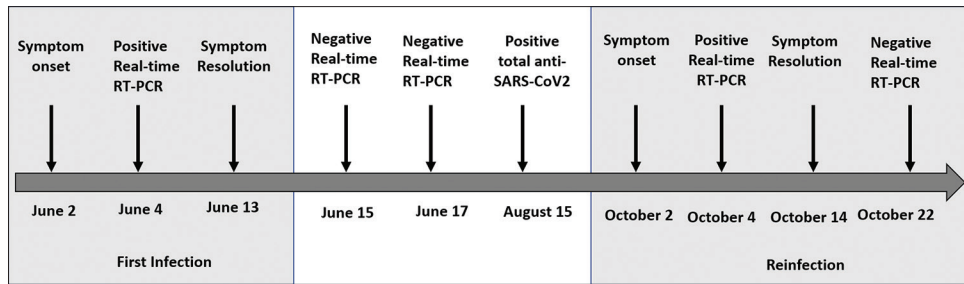


Figure 1: Timeline of symptom onset and molecular diagnosis of possible COVID-19 reinfection case. RT-PCR: reverse transcriptase-polymerase chain reaction.

positive. Blood tests showed the following: hemoglobin level, 15.8 g/dL; white blood cell count, $8.8 \times 10^9/L$; platelet count, $285 \times 10^9/L$; C-reactive protein level, 23.77 mg/L; D-dimer level, 156 ng/mL; and serum ferritin level, 447.1 ng/mL. No specific treatment was administered to the patient during the second infection. On October 14, the patient was asymptomatic. On October 22–23, he consecutively tested negative for SARS-CoV-2 twice [Figure 1].

Discussion

In the Kurdistan region of Iraq, strict policies were implemented to prevent the spread of SARS-CoV-2.^[7] However, mounting political and economic pressure demanded reopening of society at a rapidly progressive rate.^[8] On May 22, authorities lifted the lockdown and eased the policies. After reopening, the number of COVID-19 cases increased sharply, with a concurrent increase in the number of symptomatic patients and a twofold increase in the case-fatality rate.^[9] The government aimed to achieve herd immunity, assuming that acquired immunity would hinder reinfection.^[8] Despite SARS-CoV-2 infection resulting in a detectable immune response, the susceptibility of previously infected subjects to reinfection is not well understood.

Our COVID-19 patient was first diagnosed in June 2020. At the time, a government-imposed regulation required that all patients who tested positive in RT-PCR should be admitted to COVID-19 centers regardless of symptom presence.^[7] On June 13, the patient was discharged from the center after symptoms resolution and two consecutive negative RT-PCR test results. He remained symptom-free until October 2, when he returned to the emergency department. In accordance with cases reported in Belgium^[5] and Hong Kong,^[4] the reinfection presented with milder symptoms. Contrastingly, the reinfection case in the USA^[3] showed increased symptom severity.

In our case, the long period of negativity makes it unlikely that the reinfection was caused by the SARS-CoV-2 dynamic profile. Despite our patient testing positive for SARS-CoV-2 antibodies 2 months after discharge, it is unclear how long they were present. Moreover, our patient was immunocompetent and he had no disorders that may facilitate reinfection. The two viral samples were not sequenced to identify differences between the viral clades due to resource limitations. If reinfection occurs

with different virus genotypes, then vaccine efficacy should be reconsidered. Similar to the influenza vaccine, genetic studies would be needed to include multiple virus strains in the vaccine with a regular strain update.

After recovery, patients may test positive for SARS-CoV-2 for up to 45 days.^[10] Moreover, reinfection results may be explained by inaccurate or imprecise testing, or a case of continuous infection including deactivation and reactivation. Herein, consecutive testing, length of asymptomatic period (112 days), and high antibody levels after first infection make those scenarios unlikely. COVID-19 reinfection, if confirmed, would render the concept of herd immunity ineffective.

Primary care physicians should play a major role in the management of COVID-19 in the community. In order not to miss cases of SARS-CoV-2 reinfection, primary care physicians should be aware of the possibility of reinfection and incorporate this in their management plan. In addition, in our region, public awareness of COVID-19 is low,^[11,12] and primary care physicians can play a role in increasing awareness of COVID-19 in the population.

Key messages

Here, we presented a case of possible COVID-19 reinfection. Our patient presented with mild symptoms and was confirmed to have developed COVID-19 again months after fully recovering from an initial infection. Positive RT-PCR test results combined with a clinical presentation consistent with COVID-19 indicates reinfection. If confirmed, reinfection may require changes in community-based prevention strategies. Further research is needed to confirm this concept of reinfection.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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