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Coronavirus Disease Reinfection in Discharged Patients: An Update

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Dear Editor,

We are in amidst of a pandemic. While writing this letter, COVID-19, which is a devastating pandemic on humankind, has already infected 6,311,980 all over the world and has led to the death of 374,847 people in our planet. Till now, there is no cure for this dreadful disease, but many vaccines are on pipeline, which need months for clinical trials. Even though COVID-19 has only a mortality rate around 3%, and most of the patients are cured with minimal symptoms, the recurrence of the disease is questionable.[1] In spite of our knowledge in viral immunity, it has been shown that certain patients are reinfected. A report from Germany showed that a patient who was found to be resolved from the disease infected two other people. These new patients were discovered by contact tracing.[2]

There can be many reasons for this. First, do these viruses evade immunity, which necessitates the need of studies on newer aspects of viral immunity? Second, are these viruses shed in feces and whether they continued to be transmitted is another question of debate? Viral shedding from the digestive system might be more severe and lasting longer than that from the respiratory tract.[3] Third, there is the question of viral mutation. It has been reported that SARS-CoV-2 mutated some portion of its genome.[4] That can be the answer to repeated infection unlike usual flu viruses.

Finally, the time taken for viral clearance also has to be taken into account after all the symptoms are resolved. Studies from China showed that patients with COVID-19 after the resolution of symptoms were positive for SARS-CoV-2.[5] At present, there is no evidence that people who have recovered from COVID-19 and have antibodies are protected from a second infection. A study in which neutralizing antibody was considered says titers of neutralizing antibody that was not high in about 30% of patients. Moreover, the same study reports about low neutralizing antibody in recovered patients, while it reported elderly patients producing higher titers of antibody compared to younger patients, which is related to the severity of the disease.[6] This is also evident in non-human primates.[7] The reinfection of coronavirus is controversial as a study on rhesus monkeys showed that reinfection could not occur in SARS-CoV-2-infected rhesus macaques.[8]

The case report of a 46-year-old woman showed that the patient was positive for SARS-CoV-2 using reverse transcription-polymerase chain reaction (RT-PCR) method when the specimen used was oropharyngeal swab (can be reframed). Later, the patient underwent serials of RT-PCR testing which came as negative. The patient test results again became positive after these serial negative tests.[9] Authors speculated that currently, many researchers are not in a consensus regarding the contagious period of COVID-19. Hence, they consider a person in a convalescence period, which may also be infectious. They then extended their view regarding the possibility of false-negative results from upper respiratory tract specimen. This is because angiotensin-converting enzyme-2 which is supposed to be the cell entry receptor of SARS-CoV-2 is highly expressed in lungs rather than in the upper respiratory tract.[10]

It has been shown that some patients after getting discharged from the hospital found to be showing symptoms like fever and were positive for nucleic acid test. There can be many reasons for this, but some authors point this to reinfection of the virus.[11]

A case in which a woman of 56 years was confirmed as COVID-19 using laboratory investigations and turned into negative after doing twice nucleic acid testing with an interval of 24 h. But later, she was turned to be positive again after doing nucleic acid testing.

However, on the other hand, some authors say even though 14% of the discharged patients tested virus-positive again, it is unlikely to be reinfection rather may be derived from the remained virus transferred from the lower respiratory tract to the throat or nose with coughs.

However, some authors suggested that since existing data are limited data regarding antibody responses to SARS-CoV-2; then, recovery from COVID-19 might result in immunity against reinfection, at least temporarily.

However, health authorities are to be aware of the above said concerns because such patients may be at risk of complication,

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rebound infection, and also in spreading COVID-19 to their contacts.

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