CASE REPORT

FIRST DOCUMENTED REINFECTION OF SARS-COV-2 IN SECOND WAVE FROM PAKISTAN

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Little is known about the pathophysiology and immunology of Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV-2). It is not yet clear whether SARS-CoV-2 infection produces long-term immune protection, or a short-lived immunity that would fade with the passage of time. We report a first case of SARS-CoV-2 reinfection in second wave from Pakistan. A 41-year-old male, health care worker developed flu-like illness, tested positive on 6th June 2020 and became PCR negative on 19th June 2020 with reactive antibodies. After 4 months and 13 days of negative PCR, he developed symptoms again and tested positive for SARS-CoV-2 with non-reactive antibodies.

Keywords: SARS-CoV-2; COVID-19; Reinfection; Pakistan

Citation: Ul-Haq Z, Khan A, Fazid S, Noor M, Yousafzai YM, Sherin A. First documented reinfection of SARS-COV-2 in second wave from Pakistan. J Ayub Med Coll Abbottabad 2020;32(Suppl. 1):704–5.

INTRODUCTION

The pandemic of Coronavirus Disease 2019 (COVID-19) is on the rise as of 6th November a total of 0.5 million new cases were reported globally and in the second wave, western countries are reporting more cases than in their first wave.[1] There is emerging evidence of COVID-19 reinfection cases from Israel[2] and China.[3] This contradicts the assumption that once infected and recovered, warrants lifelong immunity.[4]

Zhang *et al* reported two Chinese female who had reinfection on 66th and 75th day after the initial infection, respectively.[5] Similar cases of reinfection have been reported from Netherlands[6] and Israel[2] where reinfection occurred after one month and three months of the initial infection, respectively.

CASE REPORT

A 41-year-old male, health-care worker, with no known immune-deficiencies, presented with fever (100ºF) and oxygen saturation of 90–92%. The individual tested positive for Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV-2) on Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) assay on 6th June 2020 conducted at the national reference laboratory of Pakistan. His blood counts were within normal range, and C-reactive protein level was 7.5 mg/dL (cut-off <10 mg/dL). Bilateral infiltrates were noted on chest X-ray. The patient was labelled as 'recovered' after fifteen days when he tested negative for SARS-CoV-2, and positive for SARS-CoV-2 antibodies (levels 1.97; cut-off <1).

After 4 months and 13 days of recovery, he again developed symptoms. On 1st November 2020, SARS-CoV-2 antibodies were non-reactive and he tested positive for SARS-CoV-2. On 3rd November 2020, complete blood count revealed Lymphocytes (50%), Monocytes (9%) and Eosinophils (6%). Serum Ferritin was 520.7 ng/mL and SGPT of 81 U/L with normal X-Ray chest (Table-1).

Table-1: Description of the 41-year-old male health-care worker, with no known immune-deficiencies

Variables	Initial Infection 6th June 2020	Reinfection 1st November 2020
Symptoms		
Fever	100ºF	104ºF
Shortness of Breath	Mild	Moderate
Loss of taste	Yes	No
Loss of smell	No	Yes
Restlessness	Severe	Moderate
Insomnia	Yes	Yes
Body-aches	Yes	Yes
Investigations		
Chest X-Ray	Bilateral Infiltrates	Normal
Oxygen Saturation	90–92%	89%
CRP	7 mg/L	2.1 mg/L
SARS-CoV-2 antibodies	1.97	0.08
Lymphocytes	36%	50%
Monocytes	8%	9%
Eosinophils	4%	6%

DISCUSSION

We report a documented reinfection case of COVID-19 after 4 months and 13 days of the initial infection. While in comparison, other cases reported on reinfections showed shorter duration

from the initial infection raising question on real reinfection or limitation of the PCR assay.[2] It has been reported that viral RNA shedding can last for 42 days.[7] In this instance, patient underwent complete clinical recovery between the episodes of illness. The long duration of complete recovery and subsequent clinical and laboratory evidence of infection substantiates true reinfection by SARS-CoV-2.

Several questions have been raised regarding reinfection of SARS-CoV-2. Firstly, whether reinfections occur because of a deficient antibody response? In this case, patient had developed anti- SARS-CoV-2 antibodies. Secondly, whether re-infection from a mutated strain is possible? It has been reported that more than 80 genotypical variants of SARS-CoV-2 are present globally.[8] Viral genomic sequencing data would be required to investigate the possibility of reinfection from a mutated strain. Lastly, whether the antibodies produced in SARS-CoV-2 infection are truly protective antibodies, i.e., anti-spike protein or merely indicates previous exposure to the infection? A closely followed up cohort study and mechanistic studies would be required to answer that.

In the current situation of reinfection, there is a dire need to understand the virology and characteristics of SARS-CoV-2 whether the antibody response is truly protective, and whether reinfection is due to fading immunity or reinfection by a mutant virus.

REFERENCES

1. WHO. WHO Coronavirus Disease (COVID-19) Dashboard.[Internet]. World Health Organization 2020 [Cited 2020 Nov 5]. Available from: https://covid19.who.int/?gclid=Cj0KCQiAhZT9BRDmARIsAN2E-J0oNpehg8QaL2ugG38m3nz1RS3txYxdIXN6ugdRu0LGSw_rCpexSMAaAspMEALw_wcB
2. Nachmias V, Fusman R, Mann S, Koren G. The first case of documented Covid-19 reinfection in Israel. IDCases 2020;22:e00970.
3. To KK, Hung IF, Chan KH, Yuan S, To WK, Tsang DN, *et al*. Serum antibody profile of a patient with COVID-19 reinfection. Clin Infect Dis 2020;23:ciaa1368.
4. WHO. "Immunity passports" in the context of COVID-19: scientific brief, 24 April 2020. World Health Organization; 2020.
5. Zhang K, Lau JY, Yang L, Ma ZG. SARS-CoV-2 reinfection in two patients who have recovered from COVID-19. Precis Clin Med 2020;1–2.
6. Hurst L. Two cases of Covid -19 reinfection reported in Europe**.** Euronews 2020, August 25. [Internet]. [cited 2020n Nov 5]. Available from: https://www.euronews.com/2020/08/25/two-cases-of-covid-19-reinfection-reported-in-europe
7. Hanif M, Haider MA, Ali MJ, Naz S, Sundas F. Reinfection of COVID-19 in Pakistan: A First Case Report. Cureus 2020;12(10):e11176.
8. Jabbari P, Rezaei N. With Risk of Reinfection, Is COVID-19 Here to Stay? Disaster Med Public Health Prep 2020;1

Submitted: November 7, 2020	*Revised: --*	*Accepted: November 11, 2020*

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