

Debatable immunity following a sensitisation & Vaccination to Covid 19 virus –Case Report of a Health Care Worker Presenting with Recurrent Covid 19 infections.

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I. Introduction

Covid 19 pandemic is spreading across the globe with diverse clinical presentations & a variable course. While the initial reports of COVID-19 pandemic, the infection was expected to confer immunity with a non-relapsing disease course¹, the immunity offered following an attack of the infection or vaccination is debatable. The case reports of reinfection from the other parts of the globe report a reinfection which might be a reactivation of a previous infection, with a varying presentation of an increased or milder severity.^{1,2,3,4}

We present an interesting case of Covid 19 infection occurring 3 times in a single patient, during a time span of 12 months.

II. Case Report

A 35 year old male patient working as a health worker and working in the laboratory in a tertiary care hospital designated to the treatment of Covid 19 patients reportedly tested Covid positive for 3 times in a short time span of 12 months.

The first episode of Covid 19 infection was recorded on May 25 2020 when the patient presented with a history of mild fever since two days. The patient had no past history of autoimmune disorder or any other associated comorbidities. The RT PCR test for CoV 19 was positive. The patient was admitted from 25th may 2020 to 2nd June 2020, & was discharged with a home quarantine. During that time period his blood investigations were normal (Table 1)

However the CoV 2G assay on Siemens ADVIA Centaur one month following recovery was non-reactive (<1.5) .

The patient again developed the symptoms of mild fever , loss of smell and taste and throat pain again on 7th of November when his rapid antigen test (NAAT) was reported positive. The patient was put on a home quarantine and supportive treatment. The patient resumed the routine work after the symptoms were relieved.

The patient took the 2 doses of Covidshield vaccine in January 2021 & February 2021 respectively. The antibody titre after 1 month of 2nd dose rose to an index of > 20 (> 450 BAU/ml).

The patient developed the symptoms of high grade fever, Headache & Body Pain, on the 7th of May 2021. The symptoms were of a greater severity & the presentation during this episode, probably following an infection by the double mutant strain (B.1.617) seen during the time period. The antigen test (NAAT) was positive for Covid. During the course of investigations the patient was reported to be concurrently positive for Salmonella Typhi (Enteric Fever) & treated for the same.

The HRCT scan done showed a CORAD score of 2. The laboratory Investigations showed an increased CRP level along with a minor variation of the liver function tests. Rest of the investigations were within normal limits.

Till the time of presenting the case report the patient is well recovered with no post covid sequela.

III. Discussion

The case represents a debatable immunity following a sensitisation to Covid 19 virus in the form of either a Covid 19 infection or Vaccination. It also raises a concern in terms of the extent of risk of the infection to the health care community along with the silent prevalence of the infection in the general population.

The case is associated with the following implications-

1) Although the symptoms were mild & resolved without any significant sequelae, the repeated episodes tend to take a psychological, & financial impact on the patient & his family.

- 2) The patient represents a young & healthy section of the population who got a reinfection twice, presenting with an interval of 4 months from the initial infection & 2 months from the completion of vaccination respectively (in spite of a high IgG titre following vaccination), thereby reducing the possibility of a reactivation of the primary infection.
- 3) The infection was diagnosed early in all incidences since the patient was a health care worker & had an access to the diagnostic facilities. This raises a concern to the extent of community involvement of the infection.
- 4) The Coexistence of an associated infection adds to the increased responsibility on the health care system, to avoid complications associated with a superinfection.

Various reports in the literature discuss a reinfection with the Virus.

Gouseff et al reported a case series of 11 confirmed COVID-19 patients having experienced a second episode & discussed on the possibility of re-infection or reactivation of the infection.¹

Nachmias et al described the first documented case of Covid-19 reinfection in Israel suggesting a milder presentation.² Salvaraj et al presented a case of reinfection with an increased severity.³ Torres et al reported a case of a reinfection of COVID-19 after 3 months with a distinct and more aggressive clinical presentation.⁴ Parry et al reported the first case of reinfection in HongKong.⁵ Victor et al reported a high rate of reinfection in the community. However the authors concluded the risk of reinfection in the absence of vaccination.⁶

Artiega et al reported a reinfection in a Peruvian patient.⁷

Falahi et al reported that patients test positive again or even have a recurrence of clinical symptoms & discussed the possible reasons for positive retesting, antibody responses, and review of possible reinfection case reports.⁸

Bonifacio et al reported a case with strong clinical, epidemiological and laboratorial evidence of, not only reinfection by SARS-CoV-2, but also clinical recurrence of Covid-19.⁹ West et al described two distinct infective episodes of COVID-19 occurring in the same individual.¹⁰

IV. Conclusions

- 1) The Immunity following a Covid 19 infection or vaccination is highly debatable underscoring the importance of social distancing & masking to control the spread.
- 2) Any person having a diagnosed Covid 19 infection should also be investigated for the other superadded infections which might modify the clinical course.
- 3) Laboratory investigations within normal limits during the course of the illness were associated with a complete recovery without sequela in a Covid 19 infection.

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Table 1 List of investigations during infection.

Name of investigation	1 st episode	1 st episode	3 rd episode	Normal range
	Investigations on 25/5/20	Investigations done on 28/5/20	Investigations done on 9/5/21	
Hb	15.2	15.2	13.5	(12-18) g/dl
WBC	5.0	6.13	5.3	(5.2-12.4) 10 ³ /ul
RBC	5.15	5.19	4.57	(4.5-5.5) 10 ⁶ /ul
Hct	47.3	47.5	-	(40-50) %
MCV	91.7	91.5	85.4	(83-101) fl

MCH	29.5	29.3	29.6	(27-32) pg.
MCHC	32.1	32.0	34.6	(31.5- 34.5) g/dl
RDW	13.0	12.9	11.4	(11.5-14.5) %
Platelet count	304	325	213	(130-400)10 ³ /ul
MPV	6.9	7.4	8.2	(7.2-11.1) fl
Differential WBC count	63/29/5/3/0	53/37/7/3/0	68/25/1/6/0	(40-74) (19-48)(3.4-9)(0-7)(0-.15)(0-1)
CRP	<0.6	1.68	37.95	<0.6 mg/dl= negative >0.6 mg/dl = positive
Serum Ferritin	52.1			(10-282) ng/ml
Blood. urea	26.3			(15-45) mg/dl
S. Creatinine	0.77		0.81	(0.5-1.1) mg/dl
S. Sodium	142			(132-146) mmol/L
S. Potassium	4.9			(3.5-5.5) mmol/L
S. Chloride	106			(99-109) mmol/L
LDH	173			(100-250) U/L
SGPT	27		57.47	(10-49) U/L
SGOT	24			(0-34) U/L
Alkaline phosphatase	94			(45-129) U/L
Total bilirubin	0.66		0.27	(0.3-1.2) mg/dl
Direct bilirubin	0.20		0.13	(0-0.3) mg/dl
Indirect bilirubin	0.46		0.14	
S. protein	4.9			(5.7- 8.2) g/dk
S . globulin	3.2			(3.2- 4.8) g/dl
A/G Ratio	1.53			(1.5-2.5)
PT	13.8s			(12-16) sec
INR	1.0			(0.8- 1.2) sec
APTT	29.3s			(20-35) sec
ESR	2			(0-15) mm/hr
G6PD	Negative			
S typhi H			Negative	
S typhi O			Negative	
S Para typhi AH			Negative	
S Para typhi BH			Negative	
Typhi ELISA			1.295	(<0.4= negative >0.5= positive)

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