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Correspondence

Antibody response to SARS-CoV-2 in people living with HIV



KEYWORDS

PLWH;
COVID-19;
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HIV;
Seroconversion

Dear Editor,

Little has been known about the protective immunity for COVID-19. Presence of antibodies against SARS-CoV-2 suggest protective immune response. However, few data are available regarding antibody response to COVID-19 in people living with HIV (PLWH). In this study, we reported a series of serological results among PLWH.

Retrospective analysis of all patients hospitalized for COVID-19 confirmed by reverse transcription polymerase chain–reaction (RT-PCR) were performed at an HIV/AIDS referral hospital in Tokyo, Japan between March 1, 2020 and July 20, 2020. Immunoassays for the detection of SARS-CoV-2 were measured using the measurement device developed by [The Mokobio SARS-CoV-2- IgM & IgG, against the virus' structural protein, the spike (S) protein, Quantum Dot Immunoassay, Mokobio Biotechnology R & D inc, USA] and [Architect SARS-CoV2 IgG, Abbott, USA].

Of the 83 COVID-19 patients, five were PLWH. The characteristics of them are summarized in [Table 1](#). All of them received antiretroviral therapy and their CD4+ T-cell counts had been stable. Three cases were men who have sex with men (MSM), and two cases were transgender women. All five cases were classified mild to moderate severity of COVID-19, and none required intubation. All

cases were cured and discharged. All five patients received consecutive serological test, and four of five patients had seroconversion by one month after the symptom onset, which were similar to non-HIV-infected patients.¹ One patient (Case 2) had no the seroconversion for SARS-CoV-2. He was on ART consisting of bicitgravir/tenofovir alafenamide/emtricitabine, his CD4+ T-cell count was 380 cells/ μ L and his HIV- RNA was not detected on the admission day. He had change of taste without fever, hypoxia. Chest CT scan had no abnormalities. His dysgeusia improved, but both of his IgM and IgG had been negative from Day 9 to Day 87 after the onset of the symptoms.

Ample studies have demonstrated that PLWH generally show poor serological response to other viruses or viral antigens such as hepatitis B vaccine,² especially for PLWH with a high HIV viral load and decreased CD4+ T-cell.² One previous report described that an untreated HIV case had seroconversion of SARS-CoV-2 two months after symptoms appeared.³ Moreover, a fundamental research demonstrated B-cell dysfunction was caused by HIV-1 gp120 binds directly to primary B-cell in HIV viremic individuals.⁴ Therefore, uncontrolled HIV infection may be a factor to lower the rate of seroconversion, including false negative.

However, this observation implied that seroconversion of SARS-CoV-2 in PLWH on stable ART occurred similarly to that in COVID-19 patients without HIV infection. Absence of seroconversion, as was observed in our Case 2, has been reported particularly in mild¹ or asymptomatic patients.⁵ We highlighted that seroconversion of SARS-CoV-2 was similar between well-controlled PLWH and patients without HIV. Our findings showed no evidence of poor serological response to COVID-19. Further studies should be required to elucidate the serological mechanism with PLWH, but coronavirus vaccine potentially could be suitable in PLWH.

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Table 1 The characteristics of PLWH and the serological data.

	Case 1	Case 2	Case 3	Case 4 ^a	Case 5 ^a
Age (years)	35	31	27	51	32
Sex	Male	Male	Male	TGW	TGW
CD4+ (cells/ μ L)	321	380	235	835	501
HIV-RNA (copies/mL)	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
ART	F/TAF + DTG	B/F/TAF	B/F/TAF	B/F/TAF	DTG/ABC/3TC
Symptoms	Fever, Cough, Change of taste	Change of taste	Fever, Sore throat	Fever	Fever, Cough
Severity	Mild	Mild	Mild	Mild	Mild
Infiltrates on radiograph	Bilateral pure GGO	None	Bilateral pure GGO	Bilateral pure GGO	Bilateral pure GGO
SARS-CoV2 viral load on admission	1.0×10^6 (day 7)	No data (referral visit)	7.0×10^8 (day 3)	4.1×10^4 (day 4)	22 (day 7)
Anti SARS-CoV2 IgM and IgG on admission	Negative	Negative	Negative	Negative	Negative
First positive of IgM (Titer, days) ^a	0.19 (day 22)	Negative (day 87)	Negative (day 32)	Negative (day 15)	Negative (day 17)
First positive of IgG (Titer, days) ^b	5.64 (day 22)	Negative (day 87)	6.37 (day 32)	7.6 (day 15)	5.9 (day 17)
Anti COVID-19 therapy	Lopinavir/ ritonavir	Favipiravir	Favipiravir	Lopinavir/ritonavir	none
Outcome	Cured	Cured	Cured	Cured	Cured

Abbreviations; Transgender Women: TGW, Antiretroviral therapy: ART, Tenofovir alafenamide, emtricitabine and Bictegravir: B/F/TAF, Tenofovir alafenamide and emtricitabine: F/TAF, Dolutegravir: DTG, Dolutegravir sodium and Abacavir Sulfate and Lamivudine: DTG/ABC/3TC, Ground glass opacities: GGO.

^a Mokobio.

^b Abbott.

Ethics approval and consent for publication

Ethics approval was granted by the ethics board of the Institute of Medical Science, University of Tokyo (2020-5-0420). The patients provided written informed consent.

Author contribution

MS, SY, HN, and EA constitute our team that cared for COVID-19 patients; SY and EA drafted the manuscript; MS revised the manuscript; EN and KT measured the value of the immunoglobulins; YN and YK offered the measuring kit for the immunoglobulin for SARS-CoV-2 and gave the suggestion. All authors approved the final manuscript.

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Declaration of competing interest

None to declare.

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Shinya Yamamoto

Makoto Saito

Etsuko Nagai

Keiko Toriuchi

Hiroyuki Nagai

Hiroshi Yotsuyanagi

Department of Infectious Diseases and Applied Immunology, Institute of Medical Science, The University of Tokyo, Tokyo, Japan

Yu Nakagama

Yasutoshi Kido

Department of Parasitology, Graduate School of Medicine, Osaka City University, Osaka, Japan

Eisuke Adachi*

*Department of Infectious Diseases and Applied
Immunology, Institute of Medical Science, The University
of Tokyo, Tokyo, Japan*

Medical Science, The University of Tokyo, 4-6-1 Shir-
okanedai, Minato-ku, Tokyo, Japan.
E-mail address: eadachi-ims@umin.ac.jp (E. Adachi)

*Corresponding author. Department of Infectious Diseases
and Applied Immunology, IMSUT Hospital of The Institute of

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