Short Communication

Seroprevalence of Severe Acute Respiratory Syndrome Coronavirus-2 Antibodies among People Living with HIV: A Cross-sectional Study from Tripoli University Hospital

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Abstract

Background/Aims: Patients with preexisting morbidities (e.g., malignancy, posttransplant, and heart failure) are recognized to be at increased risk of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) infection, as well as increased risk of mortality after infection. However, there are conflicting data on the susceptibility and prevalence of infection among people living with HIV (PLWH), with higher, lower, and equal prevalence to the general population were reported. The aim of this study was to assess the prevalence of SARS-CoV-2 antibodies among PLWH who are attending clinical care at the Department of Infectious Diseases of Tripoli University Hospital. **Materials and Methods:** A cross-sectional study conducted during the period from October 01, 2021 to December 01, 2021 at the (Department of Infectious Diseases) outpatient clinic of Tripoli University Hospital. The OnSite Coronavirus Disease 2019 IgG/IgM Rapid Test (CTK Biotech, San Diego County, California, USA) was used to determine the presence of antibodies against the spike protein of SARS-CoV-2 in the collected serum samples. The test results were reported as "Negative" or "Positive" as per the manufacturer's instructions. **Results:** A total of 108 PLWH were included in the study. Sixty-nine (64%) were male, and the mean age for participants was 44 years. Specific IgG/IgM antibodies for SARS-CoV-2 were detected in 31 individuals, representing a seroprevalence of 28.7%. **Conclusions:** High seroprevalence of SARS-CoV-2 antibodies among nonvaccinated PLWH attending clinical care at Tripoli University Hospital. They require pritorization on vaccination and boosting.

Keywords: HIV, Libya, prevalence, Severe acute respiratory syndrome coronavirus-2

INTRODUCTION

By the end of December 2021, more than 280 million cases of coronavirus disease 2019 (COVID-19) have been reported globally, with almost 5.5 million deaths since the start of the epidemic.[1] In Libya, 388,000 cases were reported as of December 30, 2021; all of whom had at least one positive polymerase chain reaction (PCR) test result for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection.[2]

Patients with preexisting morbidities (e.g., malignancy, posttransplant, and heart failure) are recognized to be at increased risk of SARS-CoV-2 infection, as well as increased risk of mortality after infection.[3-5] However, there are conflicting data on susceptibility and prevalence of infection among people living with HIV (PLWH), with higher,[6,7] lower,[8,9] and equal prevalence[10,11] to the general population were reported.

The diagnosis of SARS-CoV-2 infection using the PCR-based tests may underestimate the incidence and prevalence of cases as asymptomatic people are generally not studied. In addition, testing rates might be low in the vulnerable populations such as PLWH.

Seroprevalence studies could accurately determine the recent and previous infections in the general population as well as in a prespecified population of interest. They provide better insight of infection dynamics and proportion of subclinical cases.

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In this study, we aimed to assess the prevalence of SARS-CoV-2 antibodies among PLWH who are attending clinical care at the Department of Infectious Diseases of Tripoli University Hospital (TUH), a tertiary referral center.

SUBJECTS AND METHODS

Ethical Consideration

This study was conducted in accordance with the Declaration of Helsinki on ethical principles for the medical research. The study was submitted to and approved by the local ethics review board of TUH (reference: IDD-2020-011). Written informed consent was waived by the review board as the study had no direct harm to participants, and individually identifiable data would not be made publicly available.

Study Design

This was a cross-sectional study conducted during the period from October 01, 2021 to December 01, 2021 at the Department of Infectious Diseases outpatient clinic of TUH. The test for SARS-CoV-2 IgG/IgM was included in routine follow-up investigations and offered to PLWH who attended their regular follow-up visits during the study period. The test was offered irrespective of known previous COVID-19 infection. PLWH with a previous history of COVID-19 vaccination was excluded from this study.

Materials

A 5 ml of peripheral blood was extracted, centrifuged, and serum was separated. The OnSite COVID-19 IgG/IgM Rapid Test (CTK Biotech, San Diego County, California, USA), a rapid lateral flow immunoassay test with good sensitivity and specificity,[12,13] was used to determine the presence of antibodies against the spike protein of SARS-CoV-2 in the collected serum samples. The test results were reported as "Negative" or "Positive" as per the manufacturer's instructions.

Statistical Analysis

Statistical analysis was performed using R: a Language and Environment for Statistical Computing (R Foundation for Statistical Computing; version 4.0.2). Ungrouped quantitative variables were summarized using mean and standard deviation, and bivariate analysis was performed using the t-test. The categorical variables were summarized using the frequency tables and proportions/percentages of total and bivariate analysis was performed using the Chi-squared test. All analyses were two-sided, and $P < 0.05$ was considered statistically significant.

RESULTS

A total of 108 PLWH were included in the study. Sixty-nine (64%) were male, and the mean age for participants was 44 years. All participants were on HAART, but data on CD4 count and HIV viral load were not available.

Specific IgG/IgM antibodies for SARS-CoV-2 were detected in 31 individuals, representing a seroprevalence of 28.7%.

Cases who tested positive were older than their negative counterparts (42 vs. 47; $P = 0.0027$); however, there was neither gender ($P = 0.56$) nor HAART ($P = 0.58$) statistically significant differences between the positive and negative cases.

DISCUSSION

In this study, with serum samples from PLWH on regular follow-up, the prevalence of SARS-CoV-2 antibodies was 28.7%. Such a prevalence is considered high when compared to previously published reports on PLWH from Germany (1.85%),[10] Italy (0.72%),[8] the United states (3.5%),[7] and Spain (8.5%)[14] but comparable to data from Argentine (33%)[15] and lower than reports from South Africa (50%).[16]

Regional variations in SARS-CoV-2 seroprevalence among PLWH might be a reflection to the overall prevalence in the general population. It might also be due to variation in infection awareness and care, social vulnerability, and vaccination coverage.[17,18]

The high prevalence among PLWH might be due to increased susceptibility to infection, either due to the altered immune function caused by HIV[19] or because of the increased prevalence of comorbidities among PLWH.[20] However, this might also be explained by an underestimation of SARS-CoV-2 seroprevalence in the general population.

Although previous studies suggested a potential protective role for HAART against SARS-CoV-2 infection,[21] this study did not document such a benefit as all study participants were on HAART.

Our study has limitations that should be acknowledged. First, we were only able to provide information about previous exposure, and it is not clear whether IgG levels detected in PLWH in our study are protective and how long such protection may last. Second, lack of recent patient data on CD4 count and HIV viral load hindered further assessment of their contribution to infection susceptibility. Third, because of the weekly evolving dynamic of SARS-CoV-2 infections in Libya, our study may only represent a snapshot in time and reflects the circumstances of the period in which the study was performed.

Despite limitations, this study is the first to provide an approximation to the seroprevalence of SARS-CoV-2 in PLWH in Libya. It indicated a relatively high prevalence of the infection among PLWH that might warrant prioritization on SARS-CoV-2 vaccination and boosting.

CONCLUSIONS

We documented a high seroprevalence of SARS-CoV-2 antibodies among nonvaccinated PLWH attending clinical care at TUH. Further research into the response of PLWH to various approved vaccines is necessary to better understand HIV-SARS-CoV-2 immune interaction and to investigate

how that might assist in reducing the magnitude and adverse outcome of infection among PLWH.

Conflicts of interest

There are no conflicts of interest.

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