Cognitive impairment in people living with HIV not made worse by COVID-19 in those who are vaccinated, study suggests

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New research being presented at this year's European Congress of Clinical Microbiology & Infectious Diseases (ECCMID) in Copenhagen,

Denmark (15–18 April), finds that people living with HIV (PWH) performed worse on cognitive tests in the first four months following SARS-CoV-2 infection compared to people without HIV, but these differences appear to be attributable to HIV and not to COVID-19.

The study in a mostly vaccinated cohort, by Alisha Dziarski, Dr. Annukka Antar and colleagues from the Johns Hopkins University School of Medicine, Baltimore, Maryland, U.S., also suggests that processing speed is impaired in the months following COVID-19 in vaccinated people without HIV.

Neurocognitive dysfunction is common both in long COVID and in PWH. In the general population, brain fog and memory and concentration problems are commonly reported after COVID-19. Similarly, HIV affects brain function causing difficulties in attention, concentration, decision-making and memory.

However, it is not known whether people with and without HIV have different neurocognitive symptoms or sequelae following COVID-19. A recent study found that PWH are more likely to complain of neurocognitive symptoms post-COVID-19 than people without HIV.

The researchers explored this further in 294 adults living in the lower 48 U.S. states who were enrolled in the Foundation for AIDS Research (amfAR)-Johns Hopkins University COVID Recovery Study investigating the long-term effects of COVID-19 in people with and without HIV.

Since HIV-Associated Neurocognitive Disorder (HAND) is experienced by up to 50% of PWH, the research team simultaneously assessed PWH and people without HIV who believed they had never had COVID-19 to determine whether differences in cognition measured by neurologic testing associate with HIV or COVID-19.

Between June 2021 and January 2023, 294 adults (average age 47 years old were enrolled into four study arms: participants who had SARS-CoV-2 infection for the first time within 30 days before enrollment with HIV (56 PWH, arm 1) and without HIV (105, arm 2); participants with no history of SARS-CoV-2 infection with HIV (66, arm 3) and without HIV (67, arm 4). Most (94%) of the cohort had received a COVID-19 vaccine prior to enrollment.

All participants underwent a series of 11 cognitive assessments by telephone at one and four months after COVID-19 symptom onset (arms 1 and 2) and one and four months after enrollment for those who had never had COVID-19 (arms 3 and 4).

Researchers then calculated age-standardized scores for all assessments and age- sex- and education-standardized scores for verbal fluency.

Among respondents with a history of COVID-19, PWH scored lower than people without HIV on crystallized cognition (general knowledge type assessments), verbal memory and verbal fluency at 1-month post-COVID, after controlling for age, sex, years of education, and body mass index (BMI). The crystallized cognition test was also adjusted for COVID-19 vaccination, and verbal fluency tests were additionally adjusted for race, income category, and recreational drug use. The differences in verbal memory and category-cued verbal fluency persisted for least at four months post-COVID.

However, the researchers found no significant differences in any of the 11 cognitive assessments between PWH with and without a history of COVID at 1-month post infection or enrollment, respectively. This suggests that the differences in cognition between PWH and HIV-negative people post-COVID-19 were due to HIV and not to COVID-19.

When examining people without HIV, the analyses found that

respondents with a history of COVID-19 performed worse on processing speed than those who had never had COVID-19 at both 1 and 4 months, after controlling for age, sex, years of education, BMI, and recreational drug use

Respondents without HIV also scored lower on verbal memory and verbal fluency at one month post-COVID, but showed improvements by four months.

"Our research is the first to suggest that post-COVID differences in cognition between people living with HIV and without HIV are likely more so due to HIV rather than COVID-19," says Dziarski. "The cognitive changes we observed that were attributable to COVID-19 were in our HIV-negative participants. Processing speed was decreased at one and four months post-COVID in people without HIV."

She adds, "Our findings underscore the importance for health care professionals to be vigilant to these longer-lasting neurological symptoms in people living with and without HIV who have had COVID-19, and for researchers to include control populations with HIV."

The authors note limitations to their study, including that cognitive assessments were not performed before COVID-19, modest sample size, and although age, sex, years of education, BMI and recreational drug use were adjusted for in the analysis, there may have been other factors that were unreported, such as underlying illness, and severity of COVID-19, that may have influenced the outcome. The researchers did not examine whether delta versus omicron variants have similar effects on cognition.

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