12-MONTH HUMORAL RESPONSE AFTER mRNA COVID-19 VACCINATION IN PEOPLE LIVING WITH HIV

ANRS0001S COV-POPART COHORT STUDY

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BACKGROUND

- In people living with HIV (PLHIV), immunogenicity and efficacy of COVID-19 vaccines might be lower compared to HIV negative people.
- We compared the 12-month post primary vaccination humoral immune response to mRNA COVID-19 vaccines in PLHIV and controls.

METHODS

- The ANRS0001S COV-POPART cohort study is a French nationwide multicenter prospective COVID-19 vaccine cohort including immunocompromised participants and those at high risk for severe COVID-19 disease and a control group.
- Inclusions started on 25 March 2021 and ended on 31 December 2021.
- PLHIV and controls from the ANRS0001S COV-POPART were included in this analysis if they had received at least two mRNA Covid-19 vaccine doses and if results at one month after the second dose were available.
- Controls were HIV-negative healthy individuals (meaning no underlying disease or chronical treatment susceptible to alter the immune response).
- Participants with history of SARS CoV-2 infection and participants with positive SARS CoV-2 anti-nucleocapsid (NCP) antibodies pre-vaccination or at any follow-up visit were excluded from the analysis.
- Percentage (95% CI) of responders (positive anti-Spike IgG antibodies) and geometric means titers (95% CI) of anti-Spike IgG antibodies (BAU/mL) (ELISA Euroimmun) were assessed at 1 and 6 months after the 2nd dose of the primary vaccination in the whole population and at 12 months only for those who received a booster dose. Specific neutralizing antibodies (in vitro neutralization assay against original, Delta and Omicron BA.1 strains) were estimated in a subset of participants.
- Serological tests with test limits and seroneutralization for the original SARS-CoV-2 strain and for variants of concerns were performed centrally.

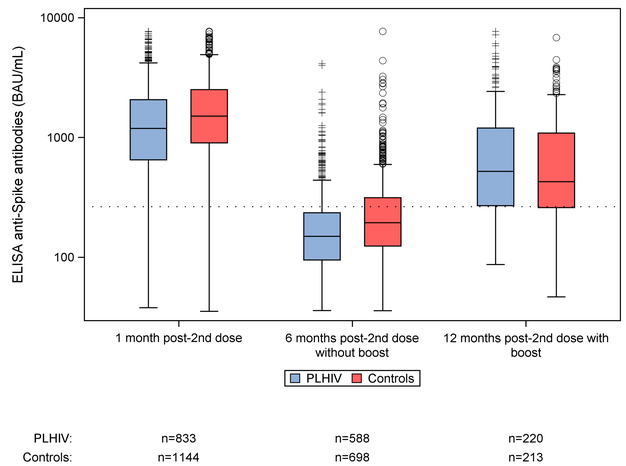
In a French nationwide multicenter COVID-19 vaccine cohort study, proportions of PLHIV who developed anti-Spike IgG antibodies at 1 and 6 months after mRNA primary vaccination was high but median anti-Spike IgG antibodies and seroneutralization titers were lower than in controls.

One mRNA booster dose increased anti Spike IgG antibodies titers to similar levels than controls at 12 months but neutralizing activity, especially against Omicron, remained lower.

RESULTS

- 858 PLHIV and 1156 controls were included.
- PLHIV were older than controls: 55.2 years, (49.6-60.6) vs 46.6 years (36.3-56.6) and more frequently male (75.1% vs 48.9%)
- Among PLHIV, 97.3% were under antiretroviral therapy, 95.6% had an undetectable viral load and 71.8% had CD4 counts above 500 cells/mm3
- Participants had namely received BNT162b2 as the primary vaccination (93% in PLHIV vs 84% in controls) and 53.1% had received a booster dose (57.2% in PLHIV (median time after the 2nd dose: 6.1 months [5.9-6.7]) and 50.1% in controls (median time 6.0 months [5.5-6.2])).
- Percentage of responders after the 2nd dose was lower in PLHIV than controls ((98.7% [97.7; 99.3] vs 99.9% [99.5; 99.9], p=0.0001)).
- PLHIV had significantly lower levels of anti-Spike antibodies at 1 month ((1188 [650; 2067] vs 1506 [950; 2507] BAU/mL, p<0.0001)) and 6 months (149 [95; 235] vs 194 [124; 314] BAU/mL, p=<0.0001) than controls (Figure 1).
- PLHIV and controls who received a booster dose had similar levels of anti-Spike antibodies at 12 months (520 [269; 1198] vs 427 [259; 1087] BAU/mL, p=0.3387) (Figure 1).

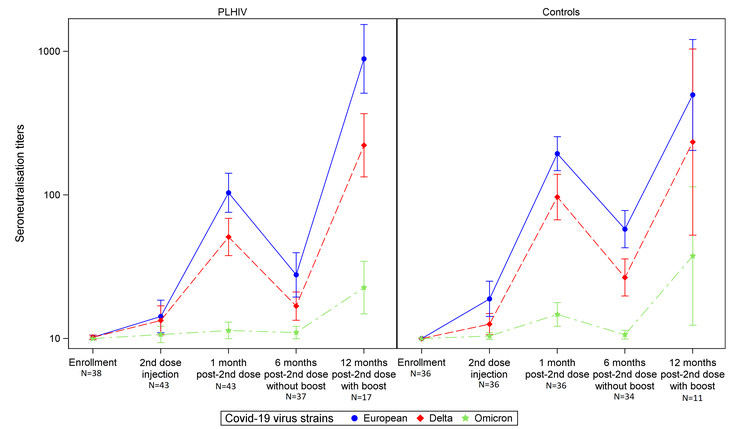
Figure 1. Median anti-Spike antibodies titers (IQR) at 1, 6 and 12 months following mRNA Covid-19 primary vaccination in PLHIV and controls



RESULTS

- PLHIV had significantly lower neutralizing antibodies against original, Delta and Omicron BA.1 strains at 1 and 6 months after primary vaccination compared to controls.
- At 12 months, the booster dose significantly increased the titers of neutralizing antibodies, in both groups, against original and Delta strains and, to a lower extent, against Omicron BA.1 (Figure 2)

Figure 2. Geometric means seroneutralization titers (95%CI) at 1, 6 and 12 months following mRNA Covid-19 primary vaccination in a subset of PLHIV and controls



CONCLUSIONS

- PLHIV had high response rates to mRNA COVID-19 vaccines but lower titers of antibodies and nAbs at 1 and 6 months after primary vaccination than controls.
- One mRNA booster dose increased SARS-CoV-2 IgG antibodies titers to similar levels than controls but neutralizing activity especially against Omicron remained lower.

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