Specific humoral and cellular responses to mRNA SARS-CoV-2 vaccination in HIV-infected adolescents

Poster number
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BACKGROUND

There is a need to assess the immunogenicity and duration of immune response to SARS-CoV-2 mRNA vaccination in HIV-infected patients. Scant data exist on HIV-infected adolescents.

METHODS

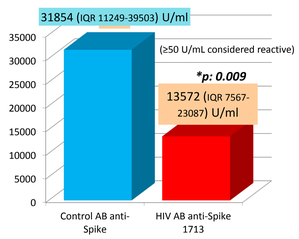
- A prospective ongoing observational study is being conducted in HIV-infected patients ≥ 12 years of age after the introduction of mRNA vaccination in Spain starting in summer 2021. Patients and controls were scheduled to obtain blood samples at 3-10 weeks after the last dose of vaccine administration and 6 months thereafter
- Blood samples were drawn 3-10 weeks after the first or second dose (according to prior SARS-CoV2 infection) of BNT162b2 (Pfizer/BioNTech) and CoV-2 mRNA-1273 (Moderna) vaccines in 21 HIV-infected adolescents and compared to 20 matched healthy control subjects, without known underlying disease, who accepted to participate.
- Humoral response was assesed by detection of SARS-CoV-2 antibodies by chemiluminescent microparticle immunoassay (CMIA) (Alinity® Quant assay-Abbott) to detect IgG against S1 region of the spike protein of SARS-CoV-2 (≥50 U/mL considered reactive).
- T Cell response to SARS-CoV-2 was measured by an interferon-gamma released assay (IGRA, Euroimmun) of S1 peptide-stimulated T-cells in whole blood (≥200 mIU/ml considered reactive)
- The study was approved by the IRB of participating centers
- Funding: This study was partially funded by IdISSC (Grant Identification number: SUBV.COV.2020.JRA)

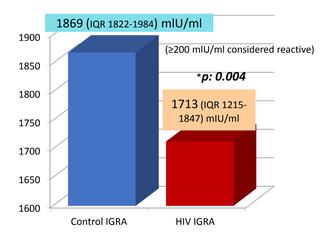
Patients characteristics	HIV-infected adolescents (n:21)	Healthy control adolescents (n:20)	p
Age: median (IQR)	17 y. (13-19.7)	15.5 y. (13-17)	0.39
Gender: female/male	12/9	14/6	0.067
Days from vaccine median (IQR). Mean ± SD	45 (30-52) 42.8 ± 15.3	34 (27-47) 38.8 ± 12.7	0.42
Nº vaccine doses (1/2)	6/14	2/19	0.23

RESULTS

- Blood samples from 21 HIV-infected adolescents followed in 5 hospitals in Madrid were drawn after vaccination with mRNA vaccination (16 Pfizer/BioNTech, 5 Moderna).

Patients characteristics: HIV-infected (n:21)	
Age: median (IQR)	17 y. (13-19.7)
Gender: female/male	12/9 (57%)
Perinatal transmission	20/21 (95%)
Origin	12 Caucasian 3 Latin America 6 Black African
CDC C or 3 classification	8/21 (38%)
Absolute CD4 nadir: median (IQR)	433 (265-637)
Percentage CD4 nadir	22 (11.7-26.2)
Current CD4: median (IQR)	700 (586-1087)
Undetectable plasma HIV-RNA	19/21 (90,5%)
Antiretroviral Treatment:	
Integrase inhibitor-based	20/21 (95%)
Protease inhibitor-based	1/21 (5%)





Values expressed as median (25-75 interquartile range)

* *Mann Whitney U Test*

- All HIV-infected patients and controls had reactive humoral responses (≥200 mIU/ml considered reactive). All control subjects and 20 HIV-infected adolescents had appropriate cellular responses (≥200 mIU/ml considered reactive). Only 1 HIV-infected patient did not reach reactive IGRA (110 mIU/ml).
- No differences were observed in humoral or celular immune responses related to the CD4 nadir, current CD4 or CDC classification (p>0.05).
- No correlation was observed between quantitative humoral and cellular responses.

CONCLUSIONS

Most perinatally HIV-infected adolescents with good immunologic status and virologic suppression elicit appropriate specific antispike antibody levels and cellular immune responses as determined by IGRA against SARS-CoV-2 shortly after mRNA vaccination,

The amount of antibodies titers reached in HIV-infected patients is significantly lower than matched healthy control adolescents

Most HIV-infected adolescents achieve reactive gamma interferon T-cell responses after vaccination, albeit of lower degree than healthy subjects

More prolonged studies are underway to assess the evolution over time of humoral and cellular immune responses after vaccination against SARS-CoV2

Further studies with larger number of HIV-infected children and adolescents are needed to determine the meaning of these preliminary findinds, and their relationship with protection against infection with different variants of SARS-CoV2