620

Low Immune Response Rate of HIV-Positive Patients to Single Injection of HAV Vaccine

Lucie Noël [1], Marc-Antoine Valantin [2], Marc Wirden [1], Sophie Sayon [1], Anne Simon [3], Christine Blanc [2], Roland Tubiana [2], Christine Katlama [2], Anne-Geneviève Marcelin [1], Vincent Calvez [1], Eve Todesco [1]

Dr Eve Todesco
eve-todesco@hotmail.fr

[1] Sorbonne Université, INSERM, Institut Pierre Louis d'Epidémiologie et de Santé Publique (iPLESP), AP-HP, Hôpital Pitié-Salpêtrière, Laboratoire de virologie, F-75013 Paris, France; [2] Sorbonne Université, INSERM, iPLESP, AP-HP, Hôpital Pitié-Salpêtrière, Services de maladies infectieuses et tropicales, F-75013 Paris, France; [3] AP-HP, Hôpital Pitié-Salpêtrière, Service de Médecine Interne, F-75013 Paris, France.

Background

- During the year 2017, a hepatitis A (HAV) outbreak occurred in France, with 2060 cases reported between January and August [1], mainly among men having sex with men (MSM). Concomitantly, a shortage of HAV vaccines has led to the national recommendations of a single injection of HAV vaccine.
- HAV vaccine has been shown to be highly immunogenic in the general population, with more than 90% of protective antibodies one month after 1 or 2 doses. Nevertheless, HIV-positive patients' vaccine response can be inferior to the general population, even after 2 HAV vaccine injections, with HAV antibody seroconversion rates from 48.5% to 93.9% in the literature [2].

- **Aim of the study**

To evaluate the immune response of HIV-1 positive patients to a single injection of HAV vaccine in this context.

Methods

- We enrolled in this observational single center study all HIV-1 positive patients who had been vaccinated by a single injection of HAV vaccine in 2017 (VAQTA 50®).
- HAV serology was performed on a serum sample before and >30 days after the vaccine injection, using the routine system Architect® (Abbott) by chemiluminescent microparticulate immunoassays.
  Response to vaccine was defined by a ratio (signal of the sample/signal of the threshold value) ≥2.
- To compare responders and non-responders' characteristics, Student (continuous variables) or Chi 2 (categories) tests for univariate statistical analyses were performed.

For characteristics with p<0.20 in univariate analyses, logistic regression for multivariate analyses was done.

Results

- In 2017, 73 patients, mainly MSM (93.2%), received a single injection of HAV vaccine.
- The median age was 49.4 years (IQR 36.0-57.1).
- HIV-1 viral load was ≤20 copies/mL in 83,6 % of the cases (93,2% ≤50 copies/mL).
- Patients were diagnosed for HIV since 14.9 years in median (IQR 7.4-27.6) and 16,4% of them were classified in the CDC stage C.
- Median CD4 and nadir CD4 cell counts were 658 (IQR 465-838) and 270/mm^3 (IQR 93-381), respectively.
- Median ratio of T CD4/CD8 cells was 0,9 (IQR 0,56-1,21).
- One patient had already a positive HAV serology before the vaccine injection and was excluded for statistical analyses.

- **The rate of immune response was 59.7%** (n=43/72) after a median time of 106 days (IQR 68-171) between the vaccine injection and the collection of sample.
  The median response ratio was 7.97 (IQR 3.47-9.56).
- **Non responders had significantly a lower T CD4/CD8 cells ratio than responders** in univariate and multivariate analyses (p<0.05).
  Statistical analyses results are presented in table 1.

Table 1. Characteristics of responders and non-responders patients and statistical analyses

	Non responders (n=29; 40,3%)	Responders (n=43; 59.7%)	Univariate analyses, p	Multivariate analyses, p
Age, median (years)	52.9	45.5	0.311	NA
HIV viral load ≤20 cp/mL, %	82.8	83.7	0.914	NA
HIV infection duration (years)	20.4	11.6	0.320	NA
CD4, median (cells/mm^3)	594	671	0.124	0,607
Nadir CD4, median (cells/mm^3)	188	294	0.386	NA
T CD4/CD8, cells ratio	0.63	1.00	0.019*	0.024*

NA: Not Applicable
* Statistically different between the responders and non-responders patients

Conclusions

Compared to general population, a low immune response rate was observed after a single injection of HAV vaccine among well-controlled HIV-positive patients [2,3]. A Low T CD4/CD8 cells ratio was a risk factor of non response. In a context of vaccine shortage, a serologic control of response to HAV vaccination should be recommended in this population to ensure their protection.

References
[1] InVS, Institut de veille sanitaire, http://invs.santepubliquefrance.fr; [2] Mena G, et al. Hepatitis B and A vaccination in HIV-infected adults: A review. Hum Vaccines Immunother. 2015;11(11):2582-2598. ; [3] WHO position paper on hepatitis A vaccines – June 2012. Wkly Epidemiol Rec 2012;87:261-76.