Impact of HIV infection and Antiretrovirals on QT interval : the HlmPaQT study

C. Allavena1, N. Jacob2, J.-B. Gourraud2, E. Billault1, S. Sécher1, F. Raffi1, G. Lamirauté2
1CHU Nantes Infectiology Nantes France ; 2CHU Nantes Cardiology Nantes France

Background

Prevalence of prolonged QT interval on electrocardiograms (ECG) of HIV infected individuals has been described as being higher than in the general population (13% to 20%). Various factors might explain cardiac repolarization changes in HIV infected individuals, including direct effect of HIV, immunodeficiency, drug toxicity (protease inhibitors [PI]) and potential confounding cardiovascular co-factors.

Inclusion criteria

- HIV-infected adults
- ECG performed before antiretroviral therapy initiation
- Current ARV therapy
- Oral informed consent

Objectives

- To assess the prevalence of prolonged QTc interval in both ART-naive and ART-exposed individuals.
- To investigate the relation between prolonged corrected QT (QTc) interval and HIV infection or antiretroviral therapy (ART).

Materials and methods

Monocentric, observational study performed in a French tertiary hospital (CHU Nantes). During a routine visit, patients were prospectively offered realization of an ECG and physicians filled out standardized electronic medical data Nadis® including comediations, biological data...

Pre-ART and on-ART ECGs were retrospectively analyzed manually by a single investigator (Cardiology Dpt, CHU Nantes) using the Bazett’s formula. QTc interval was considered as prolonged if it was > 440 ms for men and > 450 ms for women.

The effect of HIV infection and on Bazett QTc interval in the pre-ART and on-ART periods was assessed, by matched and multivariable analysis (linear multiple regression).

Results

- 255 ART-naive adults had a pre-ART ECG between January 2010 and February 2016: median age 36.4 years, 72.6% male, median CD4 428/mm3, median HIV RNA 4.6 log10 c/ml, smoker 42.5%, IDUU 14.4%, CDC Stage C 14%.
- Pre-ART and on-ART ECGs were both performed in 175 patients (Table 1).
- 6/255 pre-ART ECGs (2.3 %) and 4/175 on-ART ECGs (2.3 %) showed a prolonged QTc interval (Tables 2 and 3) with values ranging from 443 to 474 ms both in pre-ART and on-ART ECGs.

Discussions / Conclusion

- Prevalence of QTc prolongation was low (2.3%) both in HIV-naive and ART-exposed individuals.
- Neither excess risk of prolongation of the QTc interval in the ART-naive population nor prolongation of QTc interval after onset of ART were observed.
- In multivariable analysis, the only variable associated to QTc interval for both pre- and on-ART ECGs was female gender. Neither comediations nor current ART exposure, including protease inhibitors, showed statistical association to QTc interval.
- A careful methodology is needed to evaluate QTc interval in order to discard potential measurement biases, as the method of QT interval measurement remains a major issue. The strength of our study is the manual measurement of the QT interval with the Bazett’s formula. The limitations are the lack of electronic levels and potential under-reporting of co-medications with known effects on the QTc interval. ECGs were not systematically performed at time of ART at the ARV Cmx that could have pinpointed a transient QTc prolongation.
- A high prevalence of Early Repolarization was unexpectedly found in HIV-infected patients, prior to ART initiation, with a decrease of the ER prevalence under ART.
- We also found a decrease of heart rate after ART initiation that may be related to the effect of HIV on the autonomous nervous system or to patient anxiety that is likely to be greater close after HIV diagnosis.