650

Predictors of Cardiovascular Events Among Ugandan Adults on Long-Term ART: A Prospective Study

Arianna Crocetta[1], Paul Mubiri[2], Maria Chiara Ottino[1], **Andrea Calcagno**[3], Barbara Castelnuovo[2], Joseph Musaazi[2], Stefano Bonora[1]

[1]Department of Medical Sciences, University of Turin, Turin, Italy, [2]Infectious Diseases Institute, Makerere University, Kampala, Uganda, [3]Department of Translational Medicine, University of Eastern Piedmont, Novara, Italy.

BACKGROUND

People with HIV (PWH) have an approximately two-fold higher lifetime risk of cardiovascular disease (CVD) compared to those without HIV. This trend has become more evident as antiretroviral therapy (ART) has extended life-expectancy. Nearly two-thirds of PWH live in Sub-Saharan Africa, where evidence on long-term CVD outcomes remains limited and risk factors may be different from those reported in high-income countries. Additionally, CVD risk calculators underestimate the incidence of major acute cardiovascular events (MACE) thus compromising the identification of people at higher risk of such events.

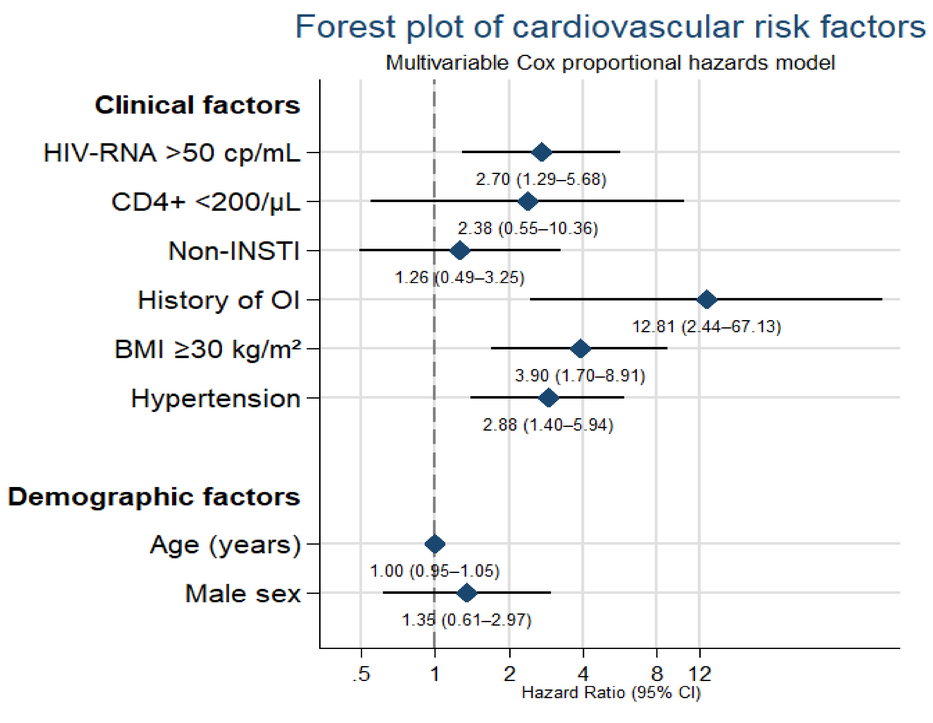
We conducted a 10 years prospective study within the Anti-Retroviral Long Term (ALT) cohort, which enrolled Ugandan adults on ART for at least 10 years, to characterize CVD risk factors.

METHODS

- We enrolled 1000, 10-years ART experienced, Ugandan adults and followed them up annually for other 10 years, (2015 – 2025)
- At each visit we collected: CD4 count, HIV viral load. opportunistic infections, ART type, co-morbidities and co-medications, and MACE (acute myocardial infarction, stroke, acute heart failure)
- Bivariate analyses were used to explore associations between variables and to select them for the multivariable regression.
- A Cox proportional hazards regression was performed to identify predictors of incident MACE (independent variable). We used as independent variables: CD4+ count >200 cells/μL, HIV detectable viraemia (VL >50 copies/mL), hypertension, age, BMI>30, and current treatment type (INSTI vs non-INSTI based regimens).
- Analyses were conducted using Stata.

We observed a 3.6/1000 person-years incidence of major cardiovascular events in people living with HIV in Uganda receiving antiretroviral treatment.
We identified traditional (obesity and hypertension) as well as HIV-related risk factors (previous opportunistic infections and detectable HIV RNA) as predictors of such events.

RESULTS At baseline participants were mostly women (617 62%), with an average age of 45.5 years (SD 7.9; CI 45.4-45.7). Median CD4+ cells count was 539 cells/μL (IQR 316 with 94% showing CD4>200/uL) and plasma HIV RNA was <50 copies/mL in 887 participants (87,7%). Previous opportunistic infections were recorded in 147 participants (14,7%). BMI was >30 Kg/m^2 in 137 patients (13,7%). Active smoking and hypertension were reported by 233 (23,3%) and 205 (20,5%) participants. ART at the enrollment was non INSTI-based. **After a median follow-up of 8.7 years (IQR 0.72) we observed 33 MACE (11 strokes, 1 AMI, 4 acute heart failure) thus having an Incidence rate of 3.6 /1,000 person-years (95% CI: 30.7-60.8).**



RESULTS (CONTINUED)

Multivariate analysis revealed that a history of **opportunistic infections** was associated with the highest risk of CDV events (HR=12.65, 95% CI: 1.88-85.21, p=0.009), so was **HIV detectable viremia** before the CDV event (HR=2.61, 95% CI: 1.22-5.59, p=0.013). About traditional risk factors: higher BMI significantly increased cardiovascular risk (HR=3.53, 95% CI: 1.51-8.24, p=0.004), and hypertension was associated with nearly three-fold increased risk (HR=2.89, 95% CI: 1.40-5.94, p=0.004). Type of ART, CD4+ count before the event, age and gender were not significantly associated with MACE.

CONCLUSIONS

This study provides novel epidemiologic evidence on cardiovascular disease among PLWH in sub-Saharan Africa and underlines the importance of combining:

- **Early ART initiation and virological control**
- **Management of traditional cardiovascular risk factors** in routinary HIV care

An integrated care model incorporating cardiovascular prevention into routine HIV care may significantly reduce cardiovascular events and long-term complications in ART-experienced populations in SSA.

LIMITATIONS AND FURTHER ANALYSIS

- Several limitations need to be acknowledged such as the potential underreporting of MACE, the lack of diagnostic tools and socioeconomic barriers.
- Further analysis are needed to better characterize CVD risk and evaluate **optimal intervention strategies** in LRCs

Contacts

- Andrea.calcagno@uniupo.it