Adverse Cardiovascular Events Morbidity and Mortality, and HIV Exposure in Cardiovascular Disease Patients in Northern Uganda

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Abstract

Background: Cardiovascular Disease (CVD) morbidity and mortality persist globally, even among patients living with Human Immunodeficiency Virus (HIV) infection in sub-Saharan Africa.

Objective: We aimed to determine the risk of all-cause mortality and morbidity of Major Adverse Cardiovascular Events (MACE) components (stroke, Acute Myocardial Infarction (AMI), and heart failure), comparing CVD patients with and without HIV infection hospitalized in two hospitals in northern Uganda.

Methods: We conducted a retrospective cohort study at Lira Regional Referral Hospital (LRRH) and Lira University Hospital (LUH) in northern Uganda. We compared outcomes between HIV and non-HIV CVD patients hospitalized from January 1st, 2015, to January 2022. Using logistic regression, Kaplan Meier, and Cox proportional hazards models, we conducted crude, adjusted, and stratified analyses for the association between components of MACE, and mortality by HIV status adjusting for confounders, and further stratified by HIV status.

Results: We identified 2,127 CVD patients, 292 (13.7%) were HIV positive, and 1,835 were non-HIV CVD patients. The majority were female (60.5%), and the HIV-positive group was younger (median age = 51 years) than the non-HIV group (median = 65 years). The risk of all-cause mortality during hospitalization was 26% and 15.8% among HIV-CVD and non-HIV CVD patients respectively. Cardiac patients with HIV had a higher proportion of heart failure (38.1% vs. 22.9%), AMI (60% vs. 36.5%), and stroke (41.8% vs. 27.8%) compared to non-HIV CVD patients. Despite the high risk of MACE among HIV-CVD patients, mortality risks remain comparable to non-HIV CVD patients. The risk of death among CVD patients with HIV-positive includes; heart failure (OR: 3.06, 95% CI: [1.56, 6.32], p-value = 0.002), stroke (OR: 2.50, 95% CI: [1.15, 5.42], p-value = 0.020), AMI (OR: 9.29, 95% CI: [4.64,19.34], p-value <0.001), and Any-MACE (OR: 3.04, 95% CI: [1.54, 6.27], p-value 0.033). The risk of death did not differ with HIV status [p-value for HIV- interaction term with heart failure, stroke, and AMI was p=0.465, p=0.613, and p=0.615 respectively].

Conclusion: Overall, all-cause mortality was higher among CVD patients with HIV compared to those without HIV infection. Despite the higher risk of MACE among HIV-positive CVD patients compared to non-HIV CVD patients, there was no evidence of increased risk of death due to any MACE component associated with the presence of HIV infection. Therefore, we suggest further studies to evaluate the association between HIV exposure and CVD in sub-Saharan Africa to improve outcomes and prevention.

Key words: Cardiovascular Disease (CVD), HIV exposure, Major Adverse Cardiovascular Events (MACE), Acute Myocardial Infarction (AMI)