Sex-specific Patterns in HIV-associated Cardiovascular Mortality in New York City

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BACKGROUND

• We previously identified a more pronounced association between HIV status and cardiovascular disease (CVD) mortality in women than men in New York City through 2012
  - Adjusted mortality rate ratio compared with HIV-negative people: in women: 2.2 (95% CI 2.0-2.4), but in men: 1.2 (95% CI 1.1-1.3)
  - Clinical Infectious Diseases 2016; 63(8): 1122-1129.
• We extend the analysis through 2017 and include additional control for neighborhood socioeconomic status (SES)
  - In New York City, women with HIV are more likely to live in low SES areas, so SES could confound associations with mortality
• Main question: Is the greater association of HIV with CVD mortality among women maintained after controlling for SES?

METHODS

SOURCE DATA: NEW YORK CITY HIV SURVEILLANCE REGISTRY

• New York City residents age 13+ reported with HIV to the population-based registry and alive between 2007 and 2017
• Linked with city Vital Statistics Registry and National Death Index to ascertain fact and cause of death
• Residents without HIV enumerated using modified US intercensal estimates after subtracting counts of those with HIV

MAIN STUDY VARIABLES

• Outcome: Death due to major cardiovascular diseases (ICD-10 codes I00-I78) as underlying cause of death
• Main exposures: HIV serostatus and sex
• Covariates: Neighborhood poverty level (based on most recently available residential information), age, race/ethnicity

STATISTICAL ANALYSIS

• We accounted for SES in association of HIV status with CVD mortality rates by sex via regression adjustment (log-linear models) and stratification by neighborhood poverty level

RESULTS

PEOPLE WITH HIV IN NEW YORK CITY, 2007-2017

% unless otherwise noted

<table>
<thead>
<tr>
<th>Age-adjusted CVD mortality rate per 1,000 person-years (95% CI)</th>
<th>Male</th>
<th>Female</th>
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<tr>
<td>2.14 (2.09-2.19)</td>
<td>2.98 (2.92-3.03)</td>
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CONCLUSIONS

• Cardiovascular disease continues to be a major cause of death for people living with HIV in New York City (now 1 in 5 deaths)
  - Providers should continue to emphasize control of viremia and preventive measures: smoking cessation, blood pressure control, lipid management
• Sex differences may reflect biological differences and/or disparate socioeconomic and behavioral profiles between men and women
  - More work is needed to better characterize how socioeconomic, behavioral, and biological factors interact in HIV-associated cardiovascular disease
• Limitations: imperfect categorization of cause of death via death certificates; no information on individual-level SES or hormone levels

ASSOCIATION OF HIV STATUS WITH CVD MORTALITY RATE BY SEX, AFTER ACCOUNTING FOR NEIGHBORHOOD POVERTY LEVEL

• Regression adjustment. Relative rate of CVD mortality attributed to HIV was attenuated but still elevated in women (RR 1.7, 95% CI 1.6-1.8) compared with men (RR 1.2, 95% CI 1.1-1.3) (P<0.001)
• Stratification by neighborhood poverty level. Within each level (<10%, 10-<20%, 20-<30%, ≥30% of neighborhood below FPL), significant differences by sex in the association between HIV and CVD mortality remained (P<0.01 within all levels)

Reference map: % of population below poverty threshold by New York City neighborhood, 2012-2016

CVD mortality rate ratio (aRR) for HIV vs non-HIV, 2007-2017, by sex and neighborhood poverty level

aRR adjusted for age, race/ethnicity, year, and in overall model, neighborhood poverty.

CVD mortality rate ratios (aRRs) for HIV vs non-HIV, 2007-2017, by sex and neighborhood poverty level

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