Excess mortality after cancer diagnosis in persons living with HIV

Kaiser Permanente Research

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Background

- It is unknown if the reduced survival for persons living with HIV (PLWH) with cancer is due to cancer treatment disparities or to general survival differences by HIV status
- Evaluating cancer-specific mortality is informative but limited by inaccurate/incomplete cause of death data
- We evaluated excess all-cause mortality among cohorts of PLWH and demographically-matched uninfected persons, which accounts for background mortality in these populations

Methods

Setting: Kaiser Permanente Northern California, Southern California, and Mid-Atlantic States (District of Columbia, Maryland, Virginia)

Design: Cohort study (2000-2016) of adult (≥21 years) PLWH and uninfected matched 1:10 by age, sex, race/ethnicity, medical center, and baseline year

Measures:

- Data sources: HIV and cancer registries; EHR
- Primary outcome: all-cause mortality
- Primary predictors: HIV status and 6 cancer groups
  (1) Any cancer
  (2) AIDS-defining cancers (ADC)
  (3) Non-AIDS-defining cancers (NADC)
  (4) HPV-related NADCs
  (5) Virus-related NADCs
  (6) Virus-unrelated NADCs
- Covariates: age, smoking, alcohol/drug use disorders, cardiovascular disease, diabetes, liver disease, renal disease, and calendar year

Statistical analysis:

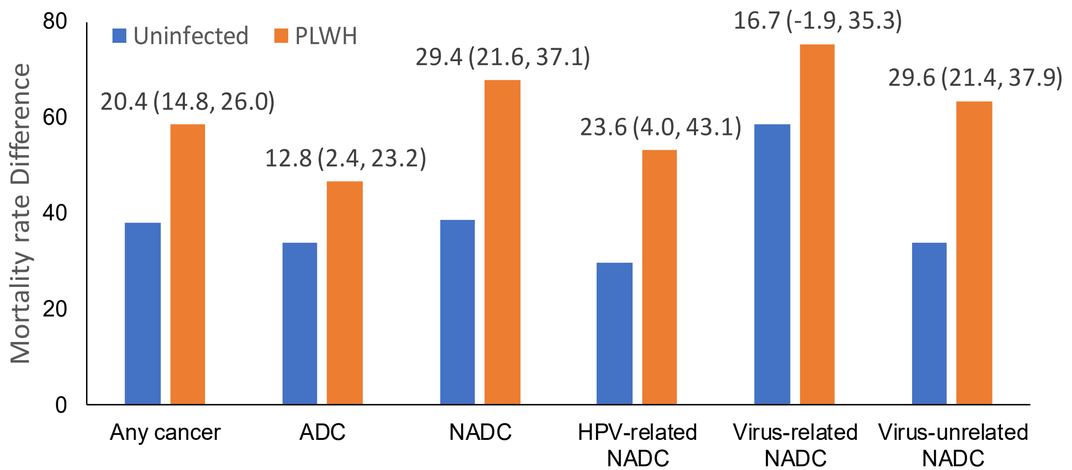
- Mortality rate differences (RD) were estimated, separately by HIV status, to measure excess mortality before vs. after cancer (RD>0 denotes increased mortality rate after cancer)
- Excess mortality rates associated with cancer among PLWH vs. uninfected persons were estimated with additive Poisson regression models

PLWH have excess mortality after a cancer diagnosis compared with uninfected persons from the same health system, despite access to comprehensive HIV and cancer care services

Results

- 39,000 PLWH (697 cancers) and 387,767 uninfected adults (2,876 cancers)
- PLWH were 88% men, 38% white, 21% black, 20% Hispanic, and 19% were ≥50 years old at baseline
- PLWH were more likely to have a history of smoking (40% vs. 30%), alcohol use disorder (11% vs. 8%) or drug use disorder (16% vs. 5%)
- Any cancer increased mortality for PLWH (RD: 58.5 deaths per 1,000 person-years) and uninfected persons (RD: 38.1 deaths per 1,000 person-years), with an excess mortality rate for any cancer of 20.4 (95% CI 14.8, 26.0) (**Figure**)
- Excess mortality rates for PLWH were lowest for ADCs (12.8) and highest for NADCs (29.4), virus-unrelated NADCs (29.6), and HPV-related NADCs (23.6) (**Figure**)

Figure. Adjusted mortality rate differences after cancer diagnosis by HIV status (bars) and excess mortality rate* for PLWH



* Excess mortality rate (95% CI) for PLWH is indicated in the figure (difference between bars)

Summary / Conclusions

- In large cohorts of PLWH and uninfected persons from the same setting, with comprehensive EHR data, we noted a higher risk of mortality following a cancer diagnosis that was not explained by the higher background mortality among PLWH
- Excess mortality was observed for all cancer groups but was lowest for ADCs. This is consistent with the more established cancer treatment guidelines for ADCs for PLWH, with limited data to inform treatment guidelines for NADCs.
- Limitations include unmeasured confounding, and reduced generalizability to women and the uninsured
- Research is needed to evaluate effectiveness and tolerability of cancer treatments in PLWH, especially for NADCs

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