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Causes of death in HIV-1-infected patients treated with antiretroviral therapy, 1996-2006: collaborative analysis of 13 HIV cohort studies.

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Abstract

BACKGROUND: We examined specific causes of mortality in human immunodeficiency virus type 1 (HIV-1)-infected patients who initiated antiretroviral therapy (ART) in Europe and North America from 1996 through 2006, and we quantified associations of prognostic factors with cause-specific mortality. **METHODS:** We retrospectively classified all deaths among 39,272 patients enrolled in 13 HIV-1 cohorts (154,667 person years of follow-up) into the categories specified in the Cause of Death (CoDe) project protocol. **RESULTS:** In 1597 (85%) of 1876 deaths, a definitive cause of death could be assigned. Among these, 792 deaths (49.5%) were AIDS related, followed by non-AIDS malignancies (189; 11.8%), non-AIDS infections (131; 8.2%), violence- and/or drug-related causes (124; 7.7%), liver disease (113; 7.0%), and cardiovascular disease (103; 6.5%). Rates of AIDS-related death (hazard ratio [HR] per 100 cell decrease, 1.43; 95% confidence interval [CI], 1.34-1.53) and death from renal failure (HR, 1.73; 95% CI, 1.18-2.55) were strongly inversely related to CD4 count at initiation of ART, whereas rates of death attributable to AIDS (HR for viral load >5 vs 5 log copies/mL, 1.31; 95% CI, 1.12-1.53), infection (HR, 1.85; 95% CI, 1.25-2.73), cardiovascular (HR, 1.54; 95% CI, 1.05-2.27), and respiratory causes (HR, 3.62; 95% CI, 1.30-10.09) were higher in patients with baseline viral load >5 log copies/mL than in other patients. Rates of each cause of death were higher in patients with presumed transmission via injection drug use than in other patients, with marked increases in rates of liver-related (HR for injection drug use vs non-injection drug use, 6.06; 95% CI, 4.03-9.09) and respiratory tract-related (HR, 4.94; 95% CI, 1.96-12.45) mortality. The proportion of deaths classified as AIDS related decreased with increasing duration of ART. **CONCLUSIONS:** Important contributors to non-AIDS mortality in treated HIV-1-infected individuals must be addressed if decreases in mortality rates are to continue.

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