No Difference in Incidence of Myocardial Infarction for HIV+ and HIV- Individuals in Recent Years

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Background/Objectives

- In an aging HIV+ population with an overall improved prognosis, medical care has increasingly focused on non-AIDS complications such as myocardial infarction (MI)
- We aimed to (1) compare MI incidence rates between HIV+ and HIV- individuals in the same health care system over time; and (2) compare Framingham risk scores and specific components of the score by HIV status in recent years

Methods

- **Study population**
  - HIV+ and HIV- Kaiser Permanente (KP) California health plan members between 1996-2011
  - HIV- adults matched 10:1 to HIV+ by age, sex, initial year of follow-up, and medical center
- **Data sources**
  - KP HIV registries
  - Comprehensive electronic medical record (EMR)
- **Outcome:** Incident inpatient MI diagnosis (ICD-9: 410.x)
- **Statistical Analysis**
  - Cohort followed until MI, left KP, death, or end of 2011
  - Incidence rates and rate ratios (RR) by HIV status
  - Poisson models adjusted for age, sex, year, census-based socioeconomic status, race/ethnicity, hypertension, smoking, diabetes, alcohol/drug abuse, overweight/obesity, and lipid-lowering therapy
  - For recent years, 2010-2011, Framingham risk score and components of score calculated, with differences by HIV status assessed by chi-square or t-test statistic

Results

1. Cohort characteristics at study entry

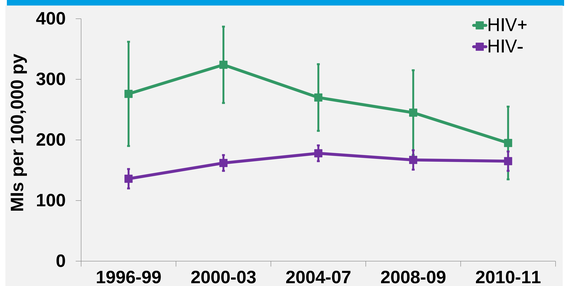
Characteristic	HIV+	HIV-
N	24,768	257,600
Age, mean (SD)	41 (10)	40 (10)
% Men	91	91
% White/Black/Hispanic	56/17/21	41/9/26
% Ever smoked (diagnosis/vital sign)	45	31
% Ever alcohol abuse diagnosis	11	7
% Ever drug abuse diagnosis	16	5
% Ever overweight/obese diagnosis	48	53
% Prior diabetes diagnosis	3	3
% Prior hypertension diagnosis	8	9
% Prior lipid-lowering therapy	6	6
% Men who have sex with men	75	—
Years known to be HIV+, mean (SD)	4 (6)	—

2. MI rates and rate ratios by HIV status, 1996-2011

	HIV+	HIV-
MI events	320	2,483
Person-years (py)	119,587	1,506,676
Incidence rate (per 100,000 py)	268	165
Unadjusted rate ratio (95% CI)	1.6 (1.5-1.8)	reference
Adjusted rate ratio (95% CI)	1.4 (1.2-1.6)	reference

Results (continued)

3. MI rates over time by HIV status



4. MI rate ratios (95% CIs) for HIV status over time (reference = HIV-)

Year	Unadjusted	Adjusted
1996-1999	2.0 (1.5, 2.8)	1.8 (1.3, 2.6)
2000-2003	2.0 (1.6, 2.5)	1.7 (1.4, 2.1)
2004-2007	1.5 (1.2, 1.9)	1.3 (1.0, 1.6)
2008-2009	1.5 (1.1, 2.0)	1.3 (0.9, 1.7)
2010-2011	1.2 (0.9, 1.6)	**1.0 (0.7, 1.4)**

Results (continued)

5. Differences by HIV status in Framingham risk scores and components of score during 2010-2011

	HIV+	HIV-	P-value
Mean Framingham risk score	9.2%	9.6%	<0.001
% Men	90.7	90.4	0.42
Mean age	47.9	48.5	<0.001
% Total cholesterol > 200 mg/dL	30.0	39.6	<0.001
% HDL<40 mg/dL	39.4	26.2	<0.001
% Ever hypertension	28.5	26.2	<0.001
% Ever smoked	48.7	34.9	<0.001

Strengths

- HIV+ & HIV- from same health system
- Large and population-based
- Comprehensive clinical data from EMR

Limitations

- Less generalizability to women and uninsured
- Imperfect measurement of risk factors, such as smoking

Summary and Conclusions

- HIV+ adults have a 40% increased risk of MIs overall compared with HIV- adults from the same health system, independent of risk factors
- **The higher risk for HIV+ adults no longer observed in more recent years**
- HIV+ adults have similar or slightly improved Framingham scores in recent years
- **The reduced MI incidence rates for HIV+ adults in recent years is likely a result of a combination of factors such as cardiovascular risk factor reduction, use of more lipid-friendly antiretroviral therapy, and reduced immunodeficiency**

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