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Hospitalizations for CHD and MI among Northern California HIV+ and HIV- Men: Additional Follow-up, Changes in Practice and Framingham Risk Scores

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BACKGROUND

- Coronary heart disease (CHD) continues to be a concern in the long term care of HIV+ patients.
- Ongoing monitoring of event rates, practice patterns and risk profiles is warranted.

METHODS

- Kaiser Permanente of Northern California (KPNC) has 3 million members and has cared for 16,000 HIV+ members of whom over 5000 are currently active.
- We update estimates of CHD and myocardial infarction (MI) event rates among HIV+ males through 6/30/2005 and compare them to rates among HIV- male members.
- We update our comparison of CHD/MI rates among protease inhibitor (PI) - exposed and PI-unexposed HIV+ patients.
- We report changes in the use of selected antiretoviral therapies (ART): stavudine (D4T), tenofovir (TDF) and atazanavir (ATV); and changes in the use of lipid lowering therapy (LLT).
- We report changes in systolic blood pressure (SBP) control and smoking.
- Measurements of individual CHD risk factors (age, smoking, SBP, total cholesterol (TC) and HDL cholesterol) were used to estimate 10-year Framingham Risk Scores (FRS) for CHD for 2000-2001, 2002-2003 and 2004-2005.

RESULTS

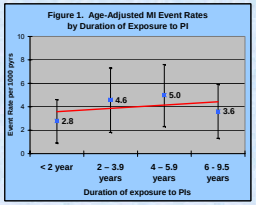
- In 9.5 yrs of observation, 5430 HIV+'s had 140 CHD events (86 MIs) in 11,390 person years (PY) of non-PI follow-up (FU) (all time before PI start or never PI, mean 2.3 yrs) and 15,527 PY of PI FU (all time after PI start, mean 4.5 yrs).
- Age-adjusted CHD/MI rates for HIV+'s were higher than for HIV-'s (CHD: 6.0 vs. 2.9 events/1000 PY, p<.001; MI: 3.6 vs. 2.2, p=.002).
- Rates for pre- and post-PI exposure continue to suggest increased risk with PI exposure (CHD: 4.8 vs. 6.9, p=.088; MI: 3.0 vs. 4.2, p=.205).
- Overall age-adjusted relative risk (RR) for MI was: 1.16 per year of PI exposure (p=.112). Figure 2.
- Percent of ART-treated pts on D4T fell from 49% to 12% (p<.001); percent of ART-treated pts on TDF rose from 3% to 46% (p<.001); percent of PI-treated pts on ATV rose from 6% to 35% (p<.001). Figure 3.
- Percent of PI-treated pts on LLT rose from 1% to 27% (p<.001). Figure 4.
- Mean cholesterol, HDL and systolic BP components of FRS each improved from 2000-2001 to 2004-2005 (p<.001).
- Percent current smokers changed from 21% in 2002-2003 to 18% in 2004-2005.
- Mean FRS did not increase from 2000-2001 to 2004-2005 (8.6% vs. 8.3%) despite a significant rise in mean age (p<.001).

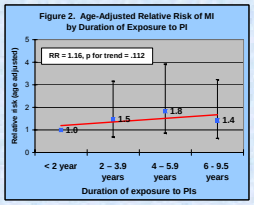
Table 1. CHD hospitalization diagnoses by HIV-1 infection status and by PI-exposure status for period January 1996 – June 2005

Hospital Diagnoses ICD-9 Description		All HIV-Negative[2] vs. HIV-Positive[1] Neg	Pos	HIV Positive:[1] No PI-Exposure vs. Yes PI-Exposure No	Yes
410	Acute myocardial infarction	821	86	26	60
411	Other acute and sub-acute IHD	172	9	1	8
412	Old myocardial infarction	0	0	0	0
413	Angina pectoris	40	3	2	1
414	Other forms of IHD	54	42	12	30
	Total	1087	140	41	99

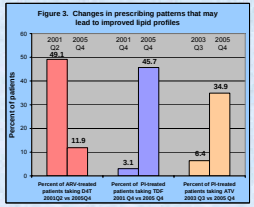
CHD = coronary heart disease (ICD-9 410-414); PI = protease inhibitor;
ICD-9 = International Classification of Diseases, 9th Revision; IHD=ischemic heart disease
1 Males, age 35-64, known HIV-positive
2 Males, age 35-64, not diagnosed HIV-positive

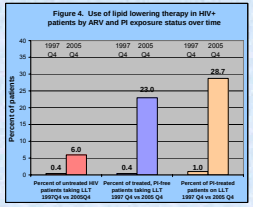
Ongoing exposure to PIs puts HIV+ patients at increased risk of MIs





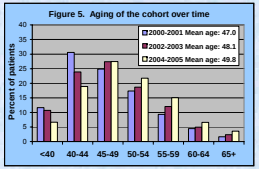
Changes in the use of Stavudine/D4T, Tenofovir/TDF and Atazanavir/ATV, and increased use of lipid lowering therapy (LLT) are likely to reduce the atherogenic effects of HIV treatment.



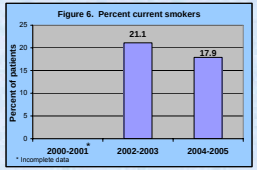


Improvement in modifiable traditional CHD risks can help to offset the effect of aging.

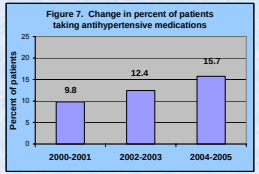
Advancing age…

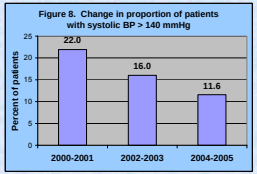


Reduced smoking…

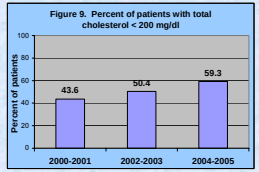


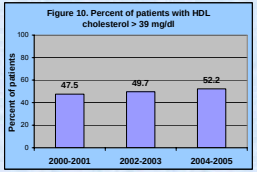
Improved management of systolic blood pressure…



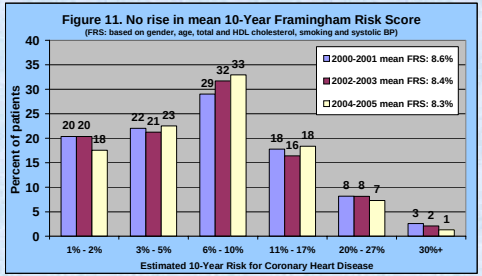


Improved management of total cholesterol… and modest rise in HDL…





Despite an aging cohort, mean 10-Year Framingham CHD risk has not increased over 5 years



CONCLUSIONS

- Significantly higher CHD / MI rates among HIV+ patients compared to HIV- patients.
- Rates of CHD and MI are not significantly different in PI-unexposed vs. PI-exposed patients but increased risk with PI exposure is suggested.
- Risk of MI appears to rise with increasing duration of PI exposure, but may be easing in the longest duration category.
- Changes in ART prescribing patterns, use of LLT and management of traditional CHD risk factors appear to offset increase risk associated with aging such that overall CHD risk is unchanged – at least in the near term.
- Steady overall 10-year CHD risk is consistent with and may be associated with the apparent tapering of MI events in recent years.

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