Incidence and Risk of Myocardial Infarction by Type in the NA-ACCORD


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Background

- HIV-infected individuals may be at increased risk for atherosclerosis and myocardial infarctions (MI).
- The Universal Definition of MI (UDMI) classifies MIs by underlying pathophysiology into classic primary (type 1) MIs due to atherothrombotic plaque rupture and secondary (type 2) MIs due to supply-demand mismatch.
- Secondary MIs may be more common in HIV.
- Previous studies in HIV have not been able to differentiate MIs by type which may limit their ability to define the specific contribution of HIV to atherosclerotic MI risk.

Methods

- Potential MIs were centrally ascertained by diagnosis or elevated cardiac enzymes in 7 NA-ACCORD cohorts between 1995-2010 and adjudicated as definite, probable, or non-events per modified Multi-Ethnic Study of Atherosclerosis (MESA) criteria by a panel of physicians.
- False positive enzyme exclusions were defined and definite and probable events were classified by type as defined by the UDMI. Screen positive individuals who did not meet MI criteria but underwent invasive cardiac interventions were classified as primary MIs.
- Cause of secondary MIs was determined based on medical record review.
- We followed individuals from study entry (baseline) defined as the latter of entry into care, cohort inception, or cohort MI observation start date until incident MI, death, or administrative censoring.

Table 1. Baseline characteristics of participants by MI status

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Primary MI (n=247)</th>
<th>Secondary MI (n=115)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>51 (45, 57)</td>
<td>52 (49, 57)</td>
</tr>
<tr>
<td>Sex (male)</td>
<td>68%</td>
<td>64%</td>
</tr>
<tr>
<td>CVD risk factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>51 (45, 57)</td>
<td>52 (49, 57)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>78%</td>
<td>81%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>43%</td>
<td>52%</td>
</tr>
<tr>
<td>Chronic kidney disease (CKD)</td>
<td>51%</td>
<td>57%</td>
</tr>
<tr>
<td>Total &amp; HDL cholesterol</td>
<td>51%</td>
<td>57%</td>
</tr>
</tbody>
</table>

Results

- We observed 271 primary (55%) and 295 secondary (45%) MIs among 35,079 persons in 300,975 person years (PY) of follow-up.
- Compared to individuals with primary MIs those with secondary MIs were more likely to be female, black, injection drug users and less likely to have older current time-updated CD4, detectable viral load, and a history of clinical AIDS were all significantly associated with increased risk of primary atherothrombotic MI.
- The high rate of secondary MIs, cholesterol, and statin use was determined based on medical record review.
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Conclusions

- Traditional CVD and HIV-related risk factors, including lower current time-updated CD4, detectable viral load, and a history of clinical AIDS were all significantly associated with increased risk of primary atherothrombotic MI.
- These findings point to the important meaning of HIV-related risk factors for MI including optimizing ART-mediated viral suppression to prevent progression to lower CD4 nadir and clinical AIDS, as well as to maximize CD4 immune reconstitution.

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References

- Figure 1. Differentiation between myocardial infarction (MI) types.
- Figure 2. Causes of secondary MIs.
- Figure 3. Crude incidence rates per 1000 PYs of primary and secondary MIs.