HIGH BURDEN OF METABOLIC COMORBIDITIES IN A CITYWIDE COHORT OF HIV OUTPATIENTS

Evolving Health Care Needs of People Aging with HIV in Washington, DC

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Background

• 1.5-2-fold increased risk of cardiovascular disease in HIV-infected populations

• Availability of population-level prevalence estimates for predisposing metabolic comorbidities will be increasingly important

• Burden of metabolic risk factors is not well-characterized in older HIV-infected populations
Objectives

1. Determine prevalence of hypertension, type 2 diabetes, dyslipidemia, and obesity in a large representative sample of HIV outpatients in Washington, DC

2. Examine differences in prevalence by age, sex, and race/ethnicity

3. Assess clinical correlates of these metabolic abnormalities
Methods

• Included participants from the DC Cohort study: an ongoing, prospective, multi-center, observational cohort study of HIV outpatients at 13 clinical sites in DC

• Routinely monitored and abstracted data in outpatient medical record systems into central database

• Conducted secondary cross-sectional analysis of participants ≥18 years old enrolled between 2011-2015
Variable Definitions

• **Hypertension**: (a) ICD-9, (b) antihypertensive, or (c) BP ≥140/90 mm Hg on ≥2 occasions

• **Type 2 Diabetes**: (a) ICD-9, (b) anti-diabetes medication, or (c) either serum glucose ≥200 mg/dL or HbA1c ≥6.5% on ≥2 occasions (fasting or non-fasting)

• **Dyslipidemia**: (a) ICD-9, (b) lipid-lowering therapy, or (c) either total cholesterol ≥200 mg/dL or HDL-C <40 mg/dL on ≥1 occasion (fasting or non-fasting)

• **Obesity**: (a) ICD-9 or (b) BMI ≥30 on ≥1 occasion
## Patient Characteristics (n=7,018)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (median, IQR)</td>
<td>50 (39-57)</td>
</tr>
<tr>
<td>Age ≥60</td>
<td>18%</td>
</tr>
<tr>
<td>Male sex at birth</td>
<td>73%</td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td>77%</td>
</tr>
<tr>
<td>ARV Exposed</td>
<td>97%</td>
</tr>
<tr>
<td>PI-based regimen</td>
<td>50%</td>
</tr>
<tr>
<td>Smoking history (current/previous)</td>
<td>63%</td>
</tr>
<tr>
<td>Receipt of primary care at site</td>
<td>74%</td>
</tr>
</tbody>
</table>
Overall Prevalence

- Hypertension: 49.8%
- Diabetes: 12.9%
- Obesity: 35.2%
- Dyslipidemia: 48.0%
- Multimorbidity: 45.6%
## Prevalence by Age Group

<table>
<thead>
<tr>
<th>Condition</th>
<th>60-69 (%)</th>
<th>≥70 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>74.1%</td>
<td>86.1%</td>
</tr>
<tr>
<td>Type 2 Diabetes</td>
<td>24.4%</td>
<td>23.9%</td>
</tr>
<tr>
<td>Obesity</td>
<td>31.1%</td>
<td>28.7%</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>68.1%</td>
<td>74.2%</td>
</tr>
<tr>
<td>Multimorbidity</td>
<td>66.0%</td>
<td>77.5%</td>
</tr>
</tbody>
</table>

All p<0.001
Prevalence by Sex

![Graph showing prevalence by sex for various health conditions]

- Hypertension
- Type 2 Diabetes
- Obesity
- Dyslipidemia
- Multimorbidity

Prevalence (%)

- Male
- Female

p<0.001 for all except hypertension

Milken Institute School of Public Health

THE GEORGE WASHINGTON UNIVERSITY
Hypertension
Type 2 Diabetes
Obesity
Dyslipidemia
Multimorbidity

Prevalence by Race/Ethnicity

All p<0.001
Proportions of Patients with Comorbidities Who Lacked Evidence of Treatment

- Hypertension: 38%
- Diabetes: 40%
- Dyslipidemia (excluding HDL-dyslipidemia): 56%
## Correlates of Metabolic Comorbidities

<table>
<thead>
<tr>
<th></th>
<th>Hypertension OR (95% CI)</th>
<th>Type 2 Diabetes OR (95% CI)</th>
<th>Dyslipidemia OR (95% CI)</th>
<th>Obesity OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time since HIV diagnosis</td>
<td>1.00 (1.00, 1.01)</td>
<td>1.01 (1.00, 1.02)*</td>
<td>1.01 (1.00, 1.02)*</td>
<td>1.00 (0.99, 1.01)</td>
</tr>
<tr>
<td>Time on PI-based regimen</td>
<td>1.01 (0.99, 1.04)</td>
<td>1.01 (0.98, 1.04)</td>
<td>1.11 (1.09, 1.14)**</td>
<td>0.98 (0.96, 1.00)</td>
</tr>
<tr>
<td>Time on NNRTI-based regimen</td>
<td>1.03 (1.01, 1.06)**</td>
<td>1.01 (0.97, 1.04)</td>
<td>1.09 (1.06, 1.12)**</td>
<td>0.95 (0.93, 0.98)**</td>
</tr>
<tr>
<td>Time on any other regimen</td>
<td>1.05 (1.01, 1.08)**</td>
<td>1.04 (1.00, 1.08)</td>
<td>1.07 (1.04, 1.11)**</td>
<td>0.95 (0.92, 0.98)**</td>
</tr>
</tbody>
</table>

ORs are per 1-year increase

*All models adjusted for age, sex at birth, race/ethnicity, HIV transmission risk category, housing status, employment status, smoking history, alcohol abuse history, recreational drug use history, whether primary care is received at the clinical site, anxiety/stress disorder, depression, hepatitis C, chronic kidney disease, hypertension, diabetes, dyslipidemia, overweight/obesity, length of time since HIV diagnosis, length of time on PI-based regimens, length of time on NNRTI-based regimens, length of time on other (non-PI-, non-NNRTI-based) regimens, most recent CD4 cell count, nadir CD4 cell count, AIDS diagnosis, and most recent viral load.

* p<0.05; ** p<0.01; *** p<0.001
Conclusions

- High prevalence of metabolic comorbidities in a contemporary cohort despite access to health care
- Very high burden of certain comorbidities among older patients
- Large proportions may have unmet treatment needs
- Models of HIV care that more centrally incorporate primary and secondary prevention of metabolic disease may be warranted
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