HIV Comorbidities: Pay Attention to Hypertension Amid Changing Guidelines – An Analysis of Texas Medical Monitoring Project Data

Based on new clinical hypertension guidelines set forth by the American Heart Association and the American College of Cardiology (ACC/AHA) in November 2017:
- 69% of people living with HIV (PLWH) who received medical care in Texas in 2013-2014 were hypertensive.
- Hypertension prevalence increased among those with traditional risk factors, such as smoking (84%), obesity (84%) and age (50 years: 83%).
- Age, sex, race or ethnicity, obesity, smoking, duration of antiretroviral therapy (ART) and time since HIV diagnosis were significant predictors of hypertension.
- Men were 2.2 times more likely to have hypertension than women (95% CI: 1.3-4.4).
- Obese participants had 5.7 times greater odds of being hypertensive than those with a body mass index (BMI) <25 (95% CI: 3.3-9.9).

Background
Before treatment for HIV became widely available, PLWH typically died within 12 years of infection. Nearly 80% of deaths among PLWH between 1987-1993 were attributable to AIDS-defining opportunistic infections or malignancies. After thirty years of advancement in treatment regimens, availability of testing, and access to care, HIV is no longer a death sentence. PLWH who achieve durable viral suppression can now survive decades after infection with a life expectancy comparable to the general population of the United States; however, with HIV diagnosis comes associated stigmatization, social isolation and mental health concerns. Hypertension is a chief risk factor for cardiovascular disease and is implicated in 75% of all cardiovascular disease deaths. In high-income countries like the U.S., the majority (53%) of deaths in PLWH are from non-AIDS causes, 15% of which result from cardiovascular disease.1

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• Age: residence and prevalence of chronic disease increases with age and as a whole, PLWH are aging.2

Incidence of hypertension among PLWH increases by ≥14 years from age 29 to 43 years (95% CI: 1.37-9.9).

• Sex: Male 74% (95% CI: 3.3-9.9).

• Ethnicity: Hispanic 36.8% (95% CI: 3.3-9.9).

• Body Mass Index (BMI): 61.1% (95% CI: 3.3-9.9).

Discussion
Our results show that PLWH are disproportionately burdened by hypertension. Why?

• Age: residence and prevalence of chronic disease increases with age and as a whole, PLWH are aging.2

Age, race, or ethnicity, obesity, smoking, duration of ART use and time since HIV diagnosis were associated with hypertension (Table 2). It should be noted, however, that age may moderate these relationships.

• ACC/AHA: After applying the lower diagnostic threshold of 130/80 mmHg recently recommended by ACC/AHA to 2013-2014 MWP survey data, prevalence of hypertension among sampled PLWH rose by more than 20 percentage points, from 47.6% to 68.7% (Table 2). Nearly one-third of PLWH with hypertension lacked evidence of hypertension diagnoses or treatment in their medical chart.

• The ACC/AHA expect that 14% more people in the general population will be diagnosed with hypertension over the next decade (95% CI: 3.3-9.9).

• Our results show that PLWH are disproportionately burdened by hypertension. Why?

- Hypertension prevalence among PLWH will remain substantially higher than the general population. Age, race or ethnicity, obesity, smoking, duration of ART use and time since HIV diagnosis were associated with hypertension; however, binge drinking became only marginally significant (Table 2).

Table 2. Hypertension prevalence among the 2013-2014 MWP sample by sociodemographic and HIV-related variables.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>JNC 7 (140/90 mmHg)</th>
<th>hypertension prevalence*</th>
</tr>
</thead>
<tbody>
<tr>
<td>JNC 7</td>
<td>47.6%</td>
<td>68.7%</td>
</tr>
<tr>
<td>Total</td>
<td>18-39</td>
<td>42.4%</td>
</tr>
<tr>
<td>≥40</td>
<td>61.3%</td>
<td>1.000000</td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
<td>47.4%</td>
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<tr>
<td></td>
<td>Female</td>
<td>48.5%</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td>Non-Hispanic white</td>
<td>50.2%</td>
</tr>
<tr>
<td></td>
<td>Hispanic</td>
<td>38.6%</td>
</tr>
</tbody>
</table>

Methods
To address this gap, we investigated the prevalence of hypertension and associated risk factors among participants of the 2013-2014 Medical Monitoring Project (MWP), a surveillance system designed by the Centers for Disease Control and Prevention (CDC) to capture clinical and behavioral data from a representative sample of PLWH who are receiving HIV care. We examined electrocardiogram records of all 157 participants from the Texas and Houston, Texas, project areas. Participants with hypertension were identified by medical diagnosis, antihypertensive medication use or high blood pressure readings within the preceding two years. We used both the diagnostic criteria set forth in the hypertension guidelines and management (JNC 7) in 2003 – the community-used threshold of 140/90 mmHg and the lower threshold of 130/80 mmHg recently recommended by the ACC/AHA in 2017 (Table 2) – in order to assess the impact of changing guidelines.1 Associations with sociodemographic characteristics were assessed using two-sample t-tests at a significance level of p < 0.05. Odds of hypertension were calculated using multivariable logistic regression models while adjusting for several demographic and HIV-related variables.

Conclusion
Hypertension is highly prevalent among PLWH, and with changing guidelines a sizable number may be undiagnosed despite indicative blood pressure readings. Since PLWH in care are living longer after HIV infection, chronic diseases and their risk factors should be routinely addressed in HIV care, particularly hypertension and weight management. This will require coordinated improvements in quality and length of life for PLWH. This may require cross-learning of both primary care providers and infectious disease specialists on the concepts of both HIV care and chronic disease prevention. PLWH may be willing to engage in such care if they are engaged in their HIV care team. Finally, other chronic disease management services they need. Public health professionals can help PLWH by increasing clinician awareness, leveraging community-based clinical linkages to support behavioral change by connecting PLWH to community resources for chronic disease management; and promoting health systems interventions to mitigate missed opportunities for diagnosis and treatment of hypertension and other chronic disease risk factors.

Human Subjects
IRB approval was not needed as this was an analysis of secondary data.

References