Undiagnosed HIV and HCV in a New York City Emergency Room, 2015

Lucia V. Torian,1 Uriel R. Felsen,3 Qiang Xia,1 Eric Rudef,2 Herbert Rose,4 Angelica Bocour,2 Gary J. Williams,5 Robert F. Bridgforth,5 Lisa A. Forgione,1 Barry S. Zingman3
The New York City Department of Health and Mental Hygiene, New York, NY. 1VHIV Epidemiology and Field Services Program and 2Viral Hepatitis Program; Montefiore Medical Center, Bronx, NY. 3Division of Infectious Diseases and 4Division of Laboratory Services; 5Quest Diagnostics, San Clemente, CA

BACKGROUND

Undiagnosed HIV and HCV infection represent missed opportunities for care, treatment and prevention of secondary transmission. CDC estimates that 13% of HIV-infected and 50% of HCV-infected persons nationwide are undiagnosed and unaware of their infection. We sought to measure the prevalence of HIV and HCV, the proportion undiagnosed and unaware, and the number needed to test in persons presenting to a busy NYC emergency room in 2015.

METHODS: Specimen Saliva and Data Matching

Design: Cross-sectional blinded serosurvey.

Specimen sources: Remaining saliva from consecutive chemistry specimens drawn March 8-May 15, 2015, for clinical indications other than HIV testing in the emergency room.

Data sources: Central Laboratory Information Management Systems, Hospital Electronic Medical Record, HIV Surveillance Registry, HCV Surveillance Registry. Process: Saliva collection; delipidate, match to hospital EMR for demographic and clinical data, match to HIV and HCV surveillance registries for diagnosed HIV and HCV.

Analysis: Calculate overall prevalence (N positive/N tested), proportion undiagnosed (N undiagnosed/N tested), number needed to test (NNTT) to detect one previously unknown.

RESULTS: HIV

Table 1. HIV Prevalence, the prevalence of undiagnosed HIV and the proportion of undiagnosed in an emergency department population in New York City, 2015, by demographic characteristics

<table>
<thead>
<tr>
<th>Age (yr)</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Proportion undiagnosed % (95% CI)</th>
<th>NNTT</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-29</td>
<td>150</td>
<td>36</td>
<td>186</td>
<td>7.6 (1.6, 14.4)</td>
<td>0.90</td>
<td>0.31</td>
</tr>
<tr>
<td>30-39</td>
<td>506</td>
<td>132</td>
<td>638</td>
<td>7.2 (1.6, 14.1)</td>
<td>1.16</td>
<td>0.09</td>
</tr>
<tr>
<td>40-49</td>
<td>266</td>
<td>104</td>
<td>370</td>
<td>5.6 (1.5, 9.9)</td>
<td>3.96</td>
<td>0.40</td>
</tr>
<tr>
<td>50-59</td>
<td>238</td>
<td>12</td>
<td>250</td>
<td>5.0 (4.4, 5.7)</td>
<td>2.51</td>
<td>0.05</td>
</tr>
<tr>
<td>60-69</td>
<td>196</td>
<td>8</td>
<td>204</td>
<td>5.4 (2.5, 8.2)</td>
<td>2.36</td>
<td>0.02</td>
</tr>
<tr>
<td>70-79</td>
<td>566</td>
<td>76</td>
<td>642</td>
<td>4.8 (2.5, 8.2)</td>
<td>2.64</td>
<td>0.01</td>
</tr>
<tr>
<td>80+</td>
<td>779</td>
<td>12</td>
<td>791</td>
<td>11.9 (9.5, 13.5)</td>
<td>0.68</td>
<td>0.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race/ethnicity</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Proportion undiagnosed % (95% CI)</th>
<th>NNTT</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic</td>
<td>266</td>
<td>112</td>
<td>378</td>
<td>4.2 (3.0, 5.7)</td>
<td>3.17</td>
<td>0.16</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>372</td>
<td>18</td>
<td>390</td>
<td>5.5 (4.2, 6.9)</td>
<td>2.37</td>
<td>0.02</td>
</tr>
</tbody>
</table>

RESULTS: HCV

Table 2. HCV prevalence, the prevalence of undiagnosed HCV and the proportion of undiagnosed in an emergency department population in New York City, 2015, by demographic characteristics

<table>
<thead>
<tr>
<th>Age (yr)</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Proportion undiagnosed % (95% CI)</th>
<th>NNTT</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-29</td>
<td>150</td>
<td>36</td>
<td>186</td>
<td>4.2 (3.0, 5.5)</td>
<td>0.23</td>
<td>0.001</td>
</tr>
<tr>
<td>30-39</td>
<td>506</td>
<td>132</td>
<td>638</td>
<td>4.0 (2.8, 5.4)</td>
<td>0.30</td>
<td>0.001</td>
</tr>
<tr>
<td>40-49</td>
<td>266</td>
<td>104</td>
<td>370</td>
<td>3.8 (2.6, 5.3)</td>
<td>0.34</td>
<td>0.001</td>
</tr>
<tr>
<td>50-59</td>
<td>238</td>
<td>12</td>
<td>250</td>
<td>4.8 (3.4, 6.4)</td>
<td>2.00</td>
<td>0.04</td>
</tr>
<tr>
<td>60-69</td>
<td>196</td>
<td>8</td>
<td>204</td>
<td>4.7 (2.9, 6.7)</td>
<td>2.03</td>
<td>0.04</td>
</tr>
<tr>
<td>70-79</td>
<td>566</td>
<td>76</td>
<td>642</td>
<td>4.7 (2.9, 6.7)</td>
<td>2.03</td>
<td>0.04</td>
</tr>
<tr>
<td>80+</td>
<td>779</td>
<td>12</td>
<td>791</td>
<td>4.9 (3.1, 7.0)</td>
<td>1.82</td>
<td>0.18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race/ethnicity</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Proportion undiagnosed % (95% CI)</th>
<th>NNTT</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic</td>
<td>266</td>
<td>112</td>
<td>378</td>
<td>4.6 (3.2, 6.2)</td>
<td>2.32</td>
<td>0.02</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>372</td>
<td>18</td>
<td>390</td>
<td>4.1 (2.7, 5.6)</td>
<td>2.50</td>
<td>0.01</td>
</tr>
</tbody>
</table>

CONCLUSIONS

- HIV prevalence and undiagnosed proportion: lowest in non-Hispanic in NYC ERs
- HCV prevalence and undiagnosed proportion high
- Serum prevalence higher than cliche estimate
- HCV prevalence is in post W.H. baby boomers
- Prevalence also high in age 70-89 and 40-59
- coherence at age limits in screening recommendations (now filled in New York State)
- Co-infection prevalent
- 32% of HCV have anti-HCV antibody
- 21% of anti-HCV positive are HCV+
- 16% of HCV RNA+ are HCV+.. Lot 18

STRENGTHS

- Availability of remnant serum
- Blinded result + signal-to-noise-ratio ≥2.0
- Supplemental/Confirmation: HIV RNA Polymerase Chain Reaction (PCR) (COBAS® Amplicor/COBAS® TaqMan HIV-1 and HIV-2 Assay, St. Louis, MO)
- Reaction result + signal-to-noise-ratio ≥2.0
- Positive result (detected) = 2 ±5 copies of HIV RNA/mL

LIMITATIONS

- HIV (1981) and HCV (1990) — Registries
- Generalization of change in diagnostic technology
- Evolution of reporting standards and requirements
- Missing data in registries against hospital EMR and laboratory data

GENERALIZABILITY

- All eras are local: serosurvey results are not representative of ERs in NYC or US

Generalizability

- ER: 1945-1965
- 80+: 2001-2015

OTHER

- 18.3% of 4,969 had cHIV+ and HCV+ in E.R.
- 19.2% of 1,604 had cHIV+ and HCV+ in E.R.
- cHIV+ and cHCV+ in E.R. was 16.1% (16.9, 15.4) in men and 16.9 (16.1, 17.7) in women (p = 0.03). 16.9 (16.1, 17.7) in women

Conclusions

- The prevalence of undiagnosed HIV and HCV in an emergency department population in New York City, 2015, by demographic characteristics

- NNTT to detect one previously diagnosed

- NNTT to detect one previously unknown

- Evolution of reporting standards and requirements

- Missing data in registries against hospital EMR and laboratory data

- All eras are local: serosurvey results are not representative of ERs in NYC or US

- ER: 1945-1965
- 80+: 2001-2015

Other

- cHIV+ and cHCV+ in E.R. was 16.1% (16.9, 15.4) in men and 16.9 (16.1, 17.7) in women (p = 0.03).
- 16.9 (16.1, 17.7) in women