The Burden of Respiratory Viral Illness in HIV-Infected Patients

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BACKGROUND

- Pulmonary infectious diseases are a leading cause of morbidity and mortality in HIV-infected patients
- Bacterial and fungal infections have been well-characterized
- The role of respiratory viruses remains poorly understood
- Data emerging from primarily resource-constrained environments demonstrate increased rates of hospitalization, longer length of stay and greater mortality due to viral infection in HIV-infected patients compared to uninfected

OBJECTIVE

To characterize the burden of respiratory viral illness in HIV-infected patients admitted to our tertiary care center

METHODS

- 80 HIV-infected patients admitted between 8/2015 and 3/2018 with a respiratory complaint (cough, dyspnea, rhinorrhea, sore throat, wheezing or stridor) were enrolled; 70 have undergone complete analysis thus far
- Nasopharyngeal swabs were collected
- Excess bronchoalveolar lavage (BAL) fluid was collected if the patient underwent a clinically indicated bronchoscopy
- Multiplex PCR testing was performed on all respiratory samples to identify 11 respiratory viruses
- Adenovirus, influenza A, influenza B, human metapneumovirus, parainfluenza 1-4, respiratory syncytial virus, rhinovirus, and coronavirus
- Demographic data and clinical information on presentation and outcomes was recorded for each subject based on chart review

RESULTS

Etiology of Respiratory Symptoms in HIV-Infected Patients (n=70)

- No infection identified 56%
- Infections etiology identified 43%
- Virus only 26%
- Bacteria 4%
- Virus + Bacteria 1%
- Infected co-infection 1%

Viral Pathogens Detected (n=23)

- RSV, 4%
- Influenza B, 4%
- Parainfluenza 4, 4%
- Adenovirus, 4%
- Coronavirus, 9%
- Parainfluenza 3, 9%
- Influenza A, 13%
- Rhinovirus, 48%

- Subjects positive for a respiratory virus (n=23)
- Subjects negative for a respiratory virus (n=47)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total subjects (n=70)</th>
<th>Subjects positive for a respiratory virus (n=23)</th>
<th>Subjects negative for a respiratory virus (n=47)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male sex</td>
<td>48 (63%)</td>
<td>13 (56%)</td>
<td>31 (66%)</td>
</tr>
<tr>
<td>Age, mean</td>
<td>48</td>
<td>51</td>
<td>48</td>
</tr>
<tr>
<td>BMI, mean (range)</td>
<td>26.3</td>
<td>28.7</td>
<td>25.2</td>
</tr>
<tr>
<td>Influenza vaccination received in last season</td>
<td>31 (44%)</td>
<td>10 (43%)</td>
<td>21 (45%)</td>
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<tr>
<td>Current smoker</td>
<td>27 (39%)</td>
<td>13 (57%)</td>
<td>14 (30%)</td>
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<tr>
<td>On ART</td>
<td>49 (70%)</td>
<td>16 (70%)</td>
<td>33 (70%)</td>
</tr>
<tr>
<td>CD4 count, mean (cells/µL)</td>
<td>262</td>
<td>337</td>
<td>225</td>
</tr>
<tr>
<td>HIV viral load, mean copies/mL</td>
<td>60,385</td>
<td>80,377</td>
<td>50,389</td>
</tr>
</tbody>
</table>

- CUI required 28 (40%) 10 (44%) 18 (38%)
- Mechanical ventilation 16 (23%) 5 (22%) 11 (23%)
- Mean number of days 7.9 10.4 6.7
- Vasopressors required 8 (11%) 3 (13%) 5 (11%)
- Mean number of days 10.6 15.3 7.8
- Discharged to higher level of care 8 (11%) 4 (18%) 4 (9%)
- Death 7 (10%) 3 (13%) 4 (9%)

LIMITATIONS

- Single academic center
- PCR-based diagnostics are primer-dependent
- No comparison to HIV-uninfected cohort

CONCLUSIONS

- Respiratory viruses represent a substantial disease burden and demonstrate significant disease severity in HIV-infected individuals
- Expanded respiratory viral testing should be considered routinely in all patients with HIV infection, as three patients had a respiratory virus that was not detected at the time of hospitalization, but only identified during research testing
- The low influenza vaccination rate among enrolled patients (45%) highlight an opportunity to improve HIV care such as increasing influenza vaccination
- The mechanisms underlying the predisposition of HIV-infected individuals to respiratory viral infection is unclear as most patients were on ART
- These findings suggest the need for future studies to better understand the effect of HIV on the antiviral defense against respiratory viral infection

Questions/comments: Please contact Subhashini.sellers@unchealth.unc.edu

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