BACKGROUND

• Individual patient comorbidities are associated with an increased risk of death in serious S. pneumoniae infections (pneumonia, bacteremia, and meningitis).1

• Concomitant comorbidities (stacked risks) may place individuals at an even greater risk of mortality, but this remains to be elucidated.

• The purpose of this study was to estimate the impact of stacked risks on 30-day mortality in patients with serious pneumococcal infections.

METHODS

• National case-control study of Veterans age ≥50 years hospitalized for pneumococcal bacteremia, meningitis, or pneumonia from 2002-2011.

• Exclusion: received pneumococcal vaccine within 5 years of culture.

• Cases: not alive 30 days after culture; controls: alive at 30 days.

• Determined risk of mortality of individual risk factors that were also vaccination indications and combinations of risk factors (stacked risks) present within one year prior to culture.

• Age ≥ 65 years, alcoholism, diabetes mellitus, heart disease, immunodeficiency, liver disease, respiratory disease, smoking

• Statistics: logistic regression to determine odds ratios

• Reference group: patients with no risk factors

RESULTS

• 9,730 serious pneumococcal infections in 9,468 patients.

• 30-day mortality = 18.6%

• 8 individual risk factors, 247 unique combinations of risk factors; 89 combinations of stacked risks significantly increased risk of mortality.

• Age and immunodeficiency were the most common risk factors present among significant combinations of stacked risks (56.2% and 55.1% of stacked risk combinations, respectively).

• Risk of mortality by number of risk factors: one (OR 1.50, 95% CI 1.08-2.07), two (OR 2.01 CI 1.47-2.75), three (OR 2.71 CI 1.99-3.69), four (OR 3.27 CI 2.39-4.47), five (OR 3.63, CI 2.60-5.07), six (OR 4.23 CI 2.69-6.65), seven (OR 2.47 CI 0.68-8.98), eight (OR 2.14 CI 0.25-18.71).

Table 1. Demographics and Infection Type.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Alive at 30 days (n=9,766)</th>
<th>Not Alive at 30 days (n=1,764)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>67 (±11)</td>
<td>71 (±11)</td>
</tr>
<tr>
<td>Male Gender</td>
<td>7,795 (97.9)</td>
<td>1,740 (98.6)</td>
</tr>
<tr>
<td>White Race</td>
<td>6,297 (79.0)</td>
<td>1,354 (76.8)</td>
</tr>
<tr>
<td>Infection Type*</td>
<td>Pneumonia</td>
<td>5,204 (65.3)</td>
</tr>
<tr>
<td></td>
<td>Bacteremia</td>
<td>1,969 (24.7)</td>
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<tr>
<td></td>
<td>Bacteremic Pneumonia</td>
<td>755 (9.5)</td>
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<td></td>
<td>*Meningitis accounted for &lt;0.5% of all infections. **Statistical significance p &lt; 0.05</td>
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CONCLUSIONS

• Risk of 30-day mortality more than doubled from 2 to 6 stacked risks in patients with serious pneumococcal infections.

• There was no significant increase in mortality risk in patients with 7 or 8 stacked risks, although sample sizes were low with these combinations.

• Prevention of disease by vaccination is essential, and becomes increasingly important in patients with greater numbers of stacked risks present.

References


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