Response: Predicting poor outcomes in community-acquired pneumonia

We appreciate the gracious and insightful comments by Chalmers\(^1\) on our recent opinion paper.\(^2\) To fully consider the points raised by Chalmers, we decided to calculate the positive and negative likelihood ratio (+LR and –LR, respectively) for several scoring systems, using data from our recently published prospective study of community-acquired pneumonia (CAP) at the Michael E. DeBakey Veteran Affairs Medical Center. The details of this study are published elsewhere.\(^3\) Of 191 immunocompetent patients with CAP, 31 (16.2\%) were admitted to the intensive care unit (ICU) and/or died within 30 days of admission. The performance of several CAP scores as predictors of a poor outcome (ICU admission and/or 30 day mortality) are shown in Table 1.

As Chalmers mentioned, –LR is of greater interest for clinicians, excluding low-risk patients (low pre-test probability of a poor outcome) from the emergency department, while +LR is better applied to high-risk (high pre-test probability of a poor outcome) patients when determining ICU admission. In our patients, SMART-COP and the IDSA/ATS minor criteria possessed the lowest –LRs and the highest +LRs. Similarly, a study by Chalmers \(et\) \(al\).\(^4\) reported lower –LRs and higher +LRs for SMART-COP and the IDSA/ATS minor criteria compared with LR for PSI and CURB-65.

In conclusion, we agree with Chalmers’ suggestion that LR offers important advantages compared with other statistical parameters such as sensitivity and area under the receiver operator characteristic (AUROC). Furthermore, we cannot overemphasize Chalmers’ point about the importance of using clinical judgment as an adjunct to prediction rules.

Conflict of interest: None declared.

M.S. Abers
Department of Medicine, Massachusetts General Hospital, Boston, MA, USA
e-mail: mabers@partners.org

N. Uy
Department of Medicine, Baylor College of Medicine, Houston, TX, USA

D.M. Musher
Department of Medicine, Baylor College of Medicine, Houston, TX, USA, Medical Care Line, Infectious Diseases Section, Michael E. DeBakey Veterans Affairs Medical Center, Houston, TX, USA

References


Table 1 Prediction of ICU admission and/or 30-day mortality\(^a\)

<table>
<thead>
<tr>
<th>Prediction rule</th>
<th>Sensitivity</th>
<th>+LR</th>
<th>–LR</th>
<th>AUROC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSI ≥ 4</td>
<td>71.0 (53.4–83.9)</td>
<td>1.18 (1.12–1.25)</td>
<td>0.73 (0.56–0.94)</td>
<td>0.65 (0.54–0.76)</td>
</tr>
<tr>
<td>CURB-65 ≥ 3</td>
<td>29.0 (16.1–46.6)</td>
<td>1.94 (1.05–3.58)</td>
<td>0.83 (0.76–0.92)</td>
<td>0.65 (0.55–0.75)</td>
</tr>
<tr>
<td>SMART COP ≥ 3</td>
<td>58.1 (40.8–73.6)</td>
<td>2.21 (1.95–2.51)</td>
<td>0.57 (0.49–0.67)</td>
<td>0.71 (0.60–0.82)</td>
</tr>
<tr>
<td>IDSA/ATS minor ≥ 3</td>
<td>51.6 (34.8–68.0)</td>
<td>3.44 (2.83–4.19)</td>
<td>0.57 (0.50–0.65)</td>
<td>0.71 (0.60–0.82)</td>
</tr>
</tbody>
</table>

\(^a\)Values reported with 95\% confidence interval are given in parentheses.

Advance Access Publication 30 July 2014