C-reactive protein values to predict sepsis-induced inflammatory response in premature infants

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C-reactive Protein values as a predictor of sepsis-induced inflammatory response in premature infants
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Background
- C-reactive protein (CRP) is a recognized biomarker of the systemic inflammatory response and levels are increased in sepsis.
- Sepsis is also a well-known cause of acute lung injury (ALI)
- We hypothesized that initial and peak CRP values would correlate with the degree of sepsis-induced ALI as measured by the pulmonary severity score (PSS).

Objectives
1. Determine if confirmed (CF) sepsis events are associated with higher initial and peak CRP values than rule out (RO) sepsis events.
2. Investigate if initial and/or peak CRP correlates with the severity of sepsis-induced ALI as measured by the PSS.

Design/Methods
- Data abstracted from Center for Pulmonary Disease Infant Repository
- Inclusion criteria: infants < 31 weeks GA and < 1500 grams with late onset sepsis and rule out sepsis events during treatment period
- Sepsis subtypes defined as: 1. Blood culture positive (Cx+), 2. Necrotizing enterocolitis (NEC), 3. Urinary tract infection (UTI), 4. Culture negative (Cx-). sepsis: blood culture negative, antibiotics (ABXs) > 6 days
- PSS collected at different time points during sepsis event as below:

Design/Methods

Results

Figure 1. Initial and peak CRP values in confirmed and rule out sepsis episodes

![Figure 1](image1.png)

Figure 2. Initial and peak CRP trajectories between confirmed and rule out sepsis

![Figure 2](image2.png)

Figure 3. Initial vs peak CRP values across sepsis subtypes

![Figure 3](image3.png)

Figure 4. Predicted PSS vs initial and peak CRP at various time points

![Figure 4](image4.png)

Comparison of CRP Values between confirmed sepsis and rule out sepsis

<table>
<thead>
<tr>
<th>Time</th>
<th>Confirmed sepsis</th>
<th>Rule out sepsis</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0hr</td>
<td>1.8 [0.7,4.5]</td>
<td>0.6 [0.5,1.1]</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>24hr</td>
<td>3.6 [0.8,8.7]</td>
<td>0.8 [0.5,1.4]</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

Discussion/Conclusion
- CRP is significantly higher both initially and at peak values in infants with CF vs RO late onset sepsis events.
- CRP values correlate with PSS over time suggesting CRP as both a marker for late onset sepsis and potentially as a predictor of the severity of sepsis-induced ALI.