Abstract: 19

Lung ultrasound predicts in-hospital mortality in acute heart failure

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On behalf: CLUSTER-HF

Topic(s):
Acute Heart Failure: Imaging

Citation:

Background: lung ultrasound (LUS) assessed B-lines have been associated with adverse clinical outcomes in patients with heart failure. Whether B-lines may predict in-hospital mortality in patients with acute HF is still undetermined.

Purpose: we sought to independently relate point-of-care LUS findings with in-hospital mortality in patients admitted with acute HF.

Methods: hand-held LUS was used to examine patients with acute HF admitted to a tertiary cardiovascular center (median age 59, 68.1% men, median LVEF 30%). LUS was performed in eight chest zones with a pocket ultrasound device. The association between B-lines and in-hospital mortality was assessed using Cox regression models. Patients were divided in tertiles: tertile 1 (0-1) & tertile 2 (2-12) constituted the reference group, and tertile 3 (>12 B-lines) constituted the "congestive" group. B-lines count, and outcome adjudication was blind.

Results: in 119 patients with adequate LUS images, the sum of B-lines ranged 0-50 (median 5) and showed bimodal distribution. ROC-AUC for B-lines and in-hospital mortality was 0.76. Age, gender, LVEF and NTproBNP were similar among both groups (Table 1). Patients in the congestive group showed increased risk for in-hospital mortality (HR 3.36, 95% CI [1.25-9.04]) p=0.016 (Figure 1). After multivariate analysis, only B-lines remained significantly associated with in-hospital mortality (HR 2.89, 95% CI [1.04-8.01]) p=0.04.

Conclusion: in patients admitted with acute HF, point-of-care LUS measurements of pulmonary congestion (B-lines) are associated with in-hospital mortality.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall, N= 119</th>
<th>B-Lines 0-12, n= 86</th>
<th>B-Lines ≥13, n=33</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean years ± SD</td>
<td>59.86 ± 1.51</td>
<td>60.48 ±1.82</td>
<td>58.19 ±2.73</td>
<td>0.50</td>
</tr>
<tr>
<td>Females, n (%)</td>
<td>38 (31.9)</td>
<td>28 (32.6)</td>
<td>10 (30.3)</td>
<td>0.81</td>
</tr>
<tr>
<td>LVEF&lt;35%, n (%)</td>
<td>50 (51.6)</td>
<td>35 (50.7)</td>
<td>15 (53.6)</td>
<td>0.79</td>
</tr>
<tr>
<td>NT pro BNP &gt;9000 pg/mL, n (%)</td>
<td>59 (50)</td>
<td>38 (44.71)</td>
<td>21 (63.64)</td>
<td>0.07</td>
</tr>
<tr>
<td>Creatinine &gt;2.0 mg/dL, n (%)</td>
<td>18 (15.2)</td>
<td>13 (15.3)</td>
<td>5 (15.2)</td>
<td>0.99</td>
</tr>
</tbody>
</table>

LVEF: Left ventricular ejection fraction.
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Variable Overall, N= 119 B-Lines 0-12, n=86 B-Lines ≥13, n=33 p value
Age, mean years ± SD 59.86 ± 1.51 60.48 ±1.82 58.19 ±2.73 0.50
Females, n (% ) 38 (31.9) 28 (32.6) 10 (30.3) 0.81
LVEF<35%, n (% ) 50 (51.6) 35 (50.7) 15 (53.6) 0.79
NT pro BNP >9000 pg/mL, n (% ) 59 (50) 38 (44.71) 21 (63.64) 0.07
Creatinine >2.0 mg/dL, n (% ) 18 (15.2) 13 (15.3) 5 (15.2) 0.99

LVEF: Left ventricular ejection fraction.