Letter to the Editor

Early warning scores: Do they predict mortality in practice?

To the Editor:

It has been a long held belief among clinicians that certain clinical markers are predictive of an adverse clinical outcome. Most healthcare systems in developed countries now use various modifications of the early warning score (EWS) system in order to triage and prioritize delivery of healthcare services.

However, do they provide adequate early warning? A recent randomized, controlled trial demonstrated that the majority of “deteriorating” patients were not detected until within 15 minutes of cardiac arrest, admission to an intensive care unit, or death. Another study suggested that late signs of deterioration would decrease the predictive value of the warning system.

Does the complexity of the warning system increase its specificity and sensitivity in the clinical setting? The answer is “yes” if one considers them in a highly theoretical and mathematical context, but they are not “user friendly” for routine clinical practice. Errors in calculating the score and significant variations in inter- and intra-observer ratings among staff have been demonstrated.

We conducted a preliminary study to explore the potential of common bedside parameters to be used as an EWS to predict in-hospital death. During a period of 1 month, 167 patients (61.1% males) admitted to the University Medical Unit, National Hospital of Sri Lanka, consented to participate in the study. On admission we recorded the Glasgow Coma Scale score, white cell count with differential neutrophil count, platelet count, and blood glucose value. We defined an adverse outcome as death and recorded the pulse rate, respiratory rate, body temperature, and systolic blood pressure. Mean values for the group with an adverse outcome was statistically compared with the mean values for controls, using Student t test.

Ten deaths (6 males and 4 females) were recorded during this period. The mean age of these patients was 61.1 years compared with the mean age of 50.1 years in the control group. The difference observed in the age was not statistically significant (Table 1). Causes of death were left ventricular failure (30%), chronic renal failure (20%), and sepsis (50%). The parameters studied failed to demonstrate a statistically significant difference between the two groups (Table 1).

Identifying and stratifying high-risk patients is extremely important and development of a clinically applicable EWS is invaluable. However, in a resource-poor setting, a balance has to be struck in keeping it simple and affordable. Although we failed in our study to demonstrate the value of common clinical parameters as markers of early warning, there is still room to explore the possibility of adding commonly available biochemical markers (erythrocyte sedimentation rate, C-reactive protein, liver, and renal function tests) to the system and determining whether these will have a predictive value. Nonetheless, including more parameters increases cost. We, therefore, suggest large-scale studies to address this requirement in patient care, taking into consideration indices that are cost-effective in resource-limited settings.

Table 1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Adverse outcome group (mean)</th>
<th>Control group (mean)</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>Age (y)</td>
<td>61.1000</td>
<td>50.0446</td>
<td>0.1134</td>
</tr>
<tr>
<td>Pulse rate (beats/min)</td>
<td>86.40</td>
<td>80.12</td>
<td>0.2626</td>
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<td>Systolic blood pressure (mmHg)</td>
<td>126.00</td>
<td>129.45</td>
<td>0.7412</td>
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<td>Body temperature (Fahrenheit)</td>
<td>98.71</td>
<td>98.66</td>
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<td>White cell count (WCC; 10³/µL)</td>
<td>14.45</td>
<td>9.85</td>
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<td>Neutrophil count (% of WCC)</td>
<td>76.75</td>
<td>70.35</td>
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<td>Platelet count (10³/µL)</td>
<td>187.38</td>
<td>224.96</td>
<td>0.0558</td>
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<td>Blood glucose level (mg/dL)</td>
<td>208.43</td>
<td>141.55</td>
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<td>Glasgow Coma Scale score</td>
<td>13.10</td>
<td>14.80</td>
<td>0.2330</td>
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References


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