PostScript

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LETTERS

Mortality predictors are not triage scores

Barlow et al[1] have shown effectively that CURB-65 outperforms generic early warning scores in the prediction of 30-day mortality from community acquired pneumonia (CAP). We are concerned, however, that stratification of 30-day mortality is taken without reflection to be an indicator of requirement for higher levels of care. In our own institution 5 of 40 patients presenting with CAP and an initial CURB-65 score of 1 required admission to high dependency or intensive care, and it has been recognised previously that a CURB-65 score may be misleadingly low in the young and otherwise fit.[2] Early warning scores were initially developed based on unexpected admissions to intensive care rather than mortality,[3] and it could in fact be argued that the better an early warning score is applied, the less it will relate to mortality as more deaths will be prevented. We have shown that a modified early warning score may not compare with CURB-65 for mortality prediction but outperforms it significantly in terms of prospectively predicting the need for hospital admission and for a higher level of care,[4] while Bynd et al have demonstrated the value of the original medical early warning score in predicting hospital admission.[5] Using simple physiology, emergency department research has demonstrated the ability to identify at first presentation those patients who are likely to deteriorate.[6]

We would suggest that mortality predictors and early warning scores are in fact different entities, developed from different cohorts and with different aims, and that conflation of the two should be avoided.

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Author's reply

We agree with Challen and colleagues that mortality prediction tools and early warning scores should only be used to predict what they have been validated to predict. It is important to recognise, however, that early warning scores have been widely implemented in acute medicine in the UK, and it is therefore inevitable that junior and inexperienced physicians will use these as prognostic tools and to guide the intensity of intervention required in community acquired pneumonia (CAP). The need for higher level care, albeit important, is not the only clinical decision that needs to be taken when a patient with CAP is admitted to hospital. For example, the physician also needs to decide about the intensity of antibiotic therapy and other supportive measures, and prognostic assessment may also be useful in discussions with patients and their relatives. In order to decide on what tool to use, the key question for the physician at the frontline is: "What do I want to predict?" As the performance characteristics of all decision support tools are dependent on the context in which they are used, the answer to this question will partly depend on the environment in which the physician finds her/himself. This is likely to explain the different performance characteristics of CURB-65 and its predecessors in different patient cohorts. In a recent study by Capelastegui and colleagues, CURB-65 was as good as the pneumonia severity index in predicting mortality and also appeared usefully to stratify the need for mechanical ventilation (0.74% (11/1480) of non-severe patients vs 2.36% (7/296) of severe patients) and hospital admission in a mixed cohort of outpatients and inpatients with CAP.[1]

In the National Health Service in the UK, relatively few patients hospitalised with CAP are admitted to higher level care. Of 433 patients with full data to calculate a CURB-65 score in our own database, 14 (3%) were admitted to intensive care, although 38% had a CURB-65 score of ≥3. In addition, those who were admitted were younger (mean age 54 years in those admitted to intensive care vs 70 years in the whole cohort) and had less co-morbidity (36% of those admitted to intensive care had a chronic illness vs 65% in the whole cohort). In this context, it is unsurprising that a tool that includes age as one of the criteria will perform less well than a tool that does not in predicting the need for admission to higher level care. Mortality, in contrast, is an outcome that applies to all patients regardless of age, co-morbidity or other patient characteristics. In a different environment such as in a country that admits a higher proportion of patients (eg, North America) or very few patients (eg, a developing country) with CAP to higher level care, or in the event of an influenza pandemic when higher level care is likely to be tightly rationed, the performance characteristics of both tools and what one wants to predict may change notably. Interestingly, in our own cohort, of the patients admitted to intensive care, CURB-65 still appeared to usefully stratify mortality (0/3 patients with a score of 0 or 1 died vs 2/5 (40%) with a score of 2 and 4/6 (66%) with a score of ≥3). It is also worth noting that early warning scores have not been validated to predict mortality in patients with either sepsis or specific infections. In contrast, CURB-65 may predict mortality in a wider range of infections.[2] As we state in our paper,[3] there may be a case for using CURB-65 on admission to hospital to guide the initial intensity of management, and thereafter or at the same time, an early warning score to identify the small number of patients who will require higher level care. Research to derive and validate better and simple prognostic tools that predict a range of patient outcomes is clearly required.

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Simple modification of CURB-65 better identifies patients including the elderly with severe CAP

We read with interest the article by Barlow et al.[1] The CURB-65 criteria currently recommended by the British Thoracic Society (BTS) based on the study by Lim et al[2] are useful and more pragmatic than other criteria, as shown in their study. However, CURB has a lower specificity in older patients and addition of the age 65 criterion to CURB adds nothing to the sensitivity and little to the specificity in hospitalised patients.[3] Increasing the urea cut off point by 2 units produces better specificity but at the expense of reduced sensitivity.[4] Recently proposed SOAR criteria (systolic BP, oxygenation, age and respiratory rate) are at least as useful as CURB-65 in older patients[3] but require additional information on arterial and inspired gas oxygen tensions. Better rules are therefore required for populations that include elderly patients. We hypothesised that using (1) age 85 as another cut off level and (2) two levels of urea cut off points at 7 mmol/l and 11 mmol/l in the scoring system would