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Title: Derivation of A New Bioscore for Predicting Mortality in Sepsis

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Abstract: Introduction: Currently, there is a lack of clinically feasible and reliable method for discriminating outcome in sepsis. We aimed to derive a new bioscore for predicting mortality in critically ill patients with sepsis using a combination of biomarkers and clinical indexes. Materials and Methods: This was a secondary analysis from a prospective study involving 159 patients with sepsis admitted to an intensive care unit (ICU). Data for key variables considered for possible inclusion in the score were collected, which included: age, sex, source of admission, comorbidities, microorganism, bacteraemia, site of infection, septic shock status, baseline Simplified Acute Physiological Score II, Sequential Organ Failure Assessment (SOFA) score (total and organ sub-scores), C-reactive protein, procalcitonin and interleukin-6 (IL-6). Approximate quintiles of each variable were given points as per the strength of their association with 30-day mortality. Results: In accordance with the statistical significance in the logistic regression analysis, the final score utilised candidate variables of age, central nervous system and liver SOFA sub-scores and IL-6. The bioscore predicted 30-day mortality with a very good performance [area under the receiver operating characteristic curve 0.814 (95% confidence interval 0.745-0.871, p <0.0001)] in our sepsis cohort. A bioscore greater than 4 predicted 30-day mortality with 80.4% sensitivity, 69.9% specificity, 2.67 positive likelihood ratio and 0.28 negative likelihood ratio. As the score increased, so did mortality rate. Conclusion: A new bioscore combining age, central nervous system and liver SOFA sub-scores and IL-6 measured on ICU admission potentially improves prediction of mortality in sepsis. Further study is warranted to prospectively validate the clinical utility of this bioscore in risk-stratifying patients with suspected sepsis.

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