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Introduction:
The Sepsis-3 Consensus definition identified organ dysfunction as the hallmark feature of sepsis¹. In developing Sepsis-3, the sequential organ failure assessment (SOFA) score was chosen for its prognostic value and relative ease of implementation clinically². We propose an update based on epidemiologic data from two intensive care databases that more effectively captures organ dysfunction in the context of Sepsis-3.

Methods:
Using the MIMIC-III (exploration) and e-ICU (validation) databases, we extracted patients with suspicion of infection to form the study cohort. The predictive power of each SOFA component was assessed using the area under the curve (AUC) for in-hospital mortality. A logistic model with the LASSO penalty was used to find an alternative statistically optimal score.

Results:
By utilising alternate markers of organ dysfunction (e.g. lactate, pH, urea nitrogen) we demonstrated a significant improvement in AUC for several versions of the new score, SOFA2.0 (Figure 1).

Conclusion:
The SOFA score can be updated to reflect current advances in clinical practice. Using epidemiologic data, we have shown that substitution of existing components with more powerful measures of organ dysfunction may provide an improved score with greater predictive power. Moreover, SOFA 2.0 exhibits equivalent ease of implementation, but better reflects organ dysfunction in the context of Sepsis-3.

References:

Image:
SOFA vs. SOFA2.0 performance evaluation

Standard deviations shown as vertical bars. SOFA2.0 version B, for instance, outperforms the SOFA score using fewer biomarkers.