Title: SIRS and qSOFA as Predictors of Use of Critical Care Interventions amongst Patients with Suspected Infection in the Emergency Department

Authors: Ari Moskowitz MD[1], Parth V. Patel BSN, RN[2], Anne V. Grossestreuer PhD[2], Maureen Chase MD MPH[2], Nathan Shapiro MD[2], Katherine Berg MD[1], Michael N. Cocchi MD[2,3], Mathias Holmberg MD[2,4], Michael W. Donnino MD[1,2]

Affiliations: [1]Beth Israel Deaconess Medical Center, Department of Medicine, Division of Pulmonary, Critical Care, and Sleep Medicine, Boston MA; [2]Beth Israel Deaconess Medical Center, Department of Emergency Medicine, Boston MA; [3]Department of Anesthesia Critical Care, Division of Critical Care [4]Research Center for Emergency Medicine, Aarhus University Hospital, Aarhus, Denmark

Abstract:

Introduction: The Sepsis III clinical criteria for the diagnosis of sepsis rely on scores derived to predict in-hospital mortality. In this study, we introduce the novel outcome of 'received critical care intervention' and investigate the related predictive performance of both the quick-Sequential Organ Failure Assessment (qSOFA) score and the Systemic Inflammatory Response Syndrome (SIRS) criteria.

Methods: This was a single center, retrospective analysis of electronic health records. Patients with suspected infection who presented to the Emergency Department (ED) and were admitted to the hospital between January 2010 and December 2014 were included. SIRS and qSOFA scores

were calculated and their relationships to the receipt of critical care intervention and in-hospital mortality were determined.

Results: 24,164 patients were included during the study period, of whom 6,647 (27.5%) were admitted to an ICU within 48-hours of ED triage; 4,413 (66.4%) of those patients also required a critical care intervention. Among those with qSOFA <2, 13.5% required a critical care intervention and 3.6% died as compared to 49.0% and 13.8% respectively for qSOFA ≥2. The area under the receiver operating characteristic (AUROC) was similar when qSOFA was used to predict receipt for critical care intervention and in-hospital mortality (AUROC 0.74 [95%CI 0.73, 0.74] vs. 0.71 [0.69, 0.72]). The AUROC for SIRS when used to predict both critical care intervention and mortality was lower than that for qSOFA (p<0.001 for both comparisons). The sensitivity of qSOFA for predicting critical care intervention was 36% (specificity 92%) as compared to 81% (specificity 47%) for SIRS.

Conclusions: ED patients with suspected infection and low qSOFA scores frequently require critical care interventions. The misclassification of these patients as 'low risk,' in combination with the low sensitivity of qSOFA ≥2, may preclude the use of qSOFA as either a tool for sepsis identification or for the triage of patients with suspected infection in the ED.

Figure: