

Sepsis Management: An Imprecise science

Ankit Gupta*

Department of Pulmonology and Critical care, Thomas Jefferson University, USA

*Corresponding Author: Ankit Gupta, Department of Pulmonology and Critical care, Thomas Jefferson University, USA.

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The incidence of sepsis/septic shock is increasing in the United States [1] and is associated with significant morbidity and mortality [2]. Between 2004 and 2009, the annual incidence of sepsis related admissions was in the range of 300–1031 per 100,000 populations [1]. With aging population and increasing awareness and recognition, the incidence of sepsis increased by an average of 13% annually, as compared with 8.7% annually between 1979 and 2000, while the case fatality rate decreased [3]. In-hospital mortality ranged from 14.7% to 29.9% for patients with severe sepsis and organ dysfunction [4]. Across all payer groups, adult sepsis cost hospitals US\$20,000 per patient in 2011 (approximately US\$21,000 in 2014 dollars according to inflation rates provided by the Bureau of Labor and Statistics and its consumer price index) [5]. Angus, *et al.* demonstrated that length of stay and especially ICU length of stay are a major component of this cost [6]. Overall sepsis related costs have been estimated to be between 16-20 billion dollars nationwide [7].

Recent data has recognized the ambiguity of various sepsis definitions and emphasized the need for easier tools to identify sepsis and organ dysfunction in various healthcare settings and was the first major revision done in the definitions since 2001 [8]. While the authors continued to emphasize the need for quick triaging and management, they recommended not using the term “severe sepsis” anymore. 19 experts from Society of Critical Care Medicine and the European Society of Intensive Care Medicine defined sepsis as life-threatening organ dysfunction caused by a dysregulated host response to infection. Furthermore outside of the ICU, a simple model (qSOFA) (quick Sequential sepsis related Organ Failure assessment score) of respiratory rate of 22/min or greater, altered mentation, or systolic blood pressure of 100 mm Hg or less was found to be predictive of the probability of organ dysfunction from sepsis. Potential criteria for organ dysfunction like SOFA or LODS (*Logistic Organ Dysfunction System*) required clinical and laboratory variables that are cumbersome to obtain and time consuming. Their utility is further diminished in the community setting with limited resources. These characteristics may increase measurement burden for clinicians. In comparison, a simple model (qSOFA) using three easy to measure clinical variables, no laboratory tests, had a predictive validity outside of the ICU that is statistically greater than the SOFA score ($P < .001$).

While this is a step in the right direction, more needs to be done to validate these predictive scores across different hospital settings i.e. outpatient/ED/general floors. The authors’ idea to simplify sepsis definitions and redo redundant terminology is commendable but should be approached with a pinch of salt. This is all retrospective data and has not been tested in a RCT. Also our experience at a major University teaching Hospital in Philadelphia has shown that although the earlier definitions for sepsis/severe sepsis were imprecise and almost 40% patients admitted to our ICUs under hospital’s severe sepsis guidelines did not require any ICU level intervention and were discharged within 24 hrs, we rarely missed a sick patient who was not triaged to the ICU early. The same cannot be said about qSOFA with confidence. Maybe this 40% is the cost of doing business and should be accepted. The need of the hour is to prospectively validate a model to predict organ dysfunction and patient decompensation. We need to stress on the sensitivity and not the specificity of such a score/model to be able to pick most at-risk patients.

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