Sepsis-3 Diagnostic Criteria as Tool to Predict Hospital Mortality in Critically-ill Patients: A Validation Study in Developing Country

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**Background:** European and American Society of Intensive Care Medicine have recently redefined the new concept of sepsis, or so-called “sepsis-3”. New diagnostic criteria, quick sepsis-related organ failure assessment (qSOFA), was purposed to achieve better prediction of hospital mortality than systemic inflammatory response syndrome (SIRS) criteria in critically ill patients. However, these criteria have not been validated in developing countries where critical care resources are limited and the burden of mortality may be differed from developed countries.

**Objective:** To validate whether qSOFA could better predict the in-hospital mortality than the previous criteria among critically-ill patients with sepsis and admitted to Thai intensive care units (ICUs).

**Method:** We performed a prospective observational study in patients with suspected infection and at least one organ dysfunction who were admitted to the ICU of Phramongkutklao Hospital (University-based hospital) or Fort Suranaree Hospital (non-University-based hospital) from July 2017 to December 2017. Primary outcome was difference in area under the ROC curves to predict hospital mortality, which compared between SIRS, SOFA, qSOFA, and APACHE II scores. Secondary outcomes were differences in ICU length of stay (LOS) and hospital LOS among those four criteria.

**Results:** A total of 101 patients were included with average age of 71.3+14.5 years. Most common underlying disease was hypertension (66.3%) and most common source of infection was respiratory tract (47.5%). Average hospital length of stay (LOS) and ICU-LOS were 23 days and 10 days, respectively. There were forty-one non-survivors (40.6%). For the prediction of hospital mortality, it was found that SIRS (>2 points), SOFA (>8 points), qSOFA (>2 points), and APACHE II (>22 points) score had 78%, 88%, 61%, and 78% sensitivity; 35%, 55%, 77%, 68% specificity and AUROC of 0.59, 0.74, 0.68, 0.78, respectively (AUROC between-group difference: SIRS vs SOFA, P=0.016; SIRS vs APACHE II, P=0.001; and qSOFA vs APACHE II, P=0.045). No difference of AUROC between SOFA and APACHE II (P=0.49) was noted.

**Conclusion:** In patients with suspected infection and admitted to the ICU, an increase in SOFA score (>8 points) or APACHE II (>22 points) has greater prognostic accuracy to predict hospital mortality than SIRS and qSOFA criteria. Our findings are aligned to the previous study in developed countries, suggesting that qSOFA criteria are limited to predict hospital mortality in the ICU setting.

**Keywords:** SIRS, SOFA, qSOFA, Sepsis-3, Intensive care unit