Translating Sepsis-3 Criteria in Children: Prognostic Accuracy of Age-adjusted Quick SOFA Score in Children Visiting the Emergency Department with Suspected Bacterial Infection

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Background

Recent attempts to translate Sepsis-3 criteria to children have been restricted to PICU patients and did not target children in emergency departments (ED). The proposed bed-side risk stratification tool; the age-adjusted quick Sequential Organ Failure Assessment score (altered mentation, systolic blood pressure and respiratory rate), could be especially useful in the ED.

Aims

1. To assess the accuracy of the qSOFA score in predicting PICU transfer and/or mortality and prolonged hospital length of stay in children presenting at the ED with suspected bacterial infection.
2. To compare our findings with performance of SIRS criteria and the qPELOD-2 score.
3. We hypothesized that the qSOFA score would perform better with lactate included (qSOFA-L) in the risk stratification tool.

Methods

Retrospective single-center study in children visiting the ED and subsequently admitted with suspected bacterial infection, defined as initiation of antibiotic therapy within 24 hours after ED registration (n=864). For every ED visit, 4 sepsis scores were calculated; qSOFA, SIRS, qPELOD-2 and qSOFA-L. We used the first measured value within 24 hours after ED registration.

Results

Positive qSOFA: 40/484 visits
Positive SIRS: 415/755 visits
Positive qPELOD-2: 11/545 visits
Positive qSOFA-L: 40/151 visits

Discussion

Conclusions

1. qSOFA is a moderate predictor of PICU transfer and/or mortality in children. qSOFA is a poor predictor of prolonged hospital length of stay.
2. The prognostic accuracy of qSOFA tends to be higher than commonly used SIRS criteria and was significantly higher than the qPELOD-2 score.
3. Inclusion of lactate in the qSOFA score does not seem to be contributory.

Future perspectives

- Prospective multicenter studies
- Larger cohorts of febrile children
- Pediatric Sepsis-3 criteria that are applicable to ED patients

	Primary outcome: PICU transfer and/or mortality	Secondary outcome: Prolonged Hospital LOS (≥ 7 days)	Comparison to AUROC qSOFA positive	
	Area under the curve (95% CI)	Area under the curve (95% CI)	P-value 1 st outcome	P-value 2 nd outcome
qSOFA positive	0.72 (0.57-0.86)	0.53 (0.46-0.59)	-	-
SIRS positive	0.64 (0.53-0.74)	0.49 (0.44-0.54)	0.23	0.82
qPELOD-2 positive	0.60 (0.45-0.76)	0.51 (0.45-0.57)	0.03	0.25
qSOFA-lactate positive	0.67 (0.50-0.84)	0.56 (0.46-0.67)	<0.01	0.58

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