Category :**Sepsis: biomarkers**

A271 - ***A 29-mrna host response risk classifier enhances severity prediction in patients with suspected infection in the emergency department – a multicenter, observational study***

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Introduction:

Rapid risk stratification for patients with suspected infections is critical for appropriate resource utilization and disposition. Validated clinical risk tools like qSOFA can be calculated at the bedside but suffer from limited accuracy in predicting outcomes, while time delay between infection, host response, and disease progression hampers the utility of routine biomarkers. We examined the performance of a 29-mRNA-based algorithm (IMX-SEV-3) as a predictor of clinical deterioration based on early host response patterns to acute infection.

Methods:

568 adult patients presenting to 6 US and 1 European emergency departments with suspected acute infection and/or sepsis of any etiology were enrolled (ClinicalTrials.gov: NCT03744741). Following consent, expression levels of 29 genes (+4 housekeeping genes) were measured on NanoString nCounter® and used as an input for a proprietary machine-learning classifier (IMX-SEV-3). Output severity scores were separated into three risk bands (low, moderate, and high) according to a priori locked cut-offs and compared to qSOFA for the composite endpoint “clinical deterioration” (need for vasopressors or mechanical ventilation within 7d, and/or 30d in-hospital mortality).

Results:

65.3% of patients were judged by forced expert adjudication to have bacterial, viral, or co-infection. Overall, 46 patients (8.1%) reached the composite severity endpoint. qSOFA positive (≥2 points) patients had a risk of 21.4% to reach the composite endpoint, while qSOFA negative (≤1 points) patients had a risk of 6.6% (Table 1). Adding the IMX-SEV-3 classifier improved stratification in both qSOFA subgroups effectively: For high qSOFA, the endpoint was reached in 8%, 18%, and 50% (low, moderate, and high bands, respectively), while for low qSOFA, the endpoint was reached in 2%, 11%, and 18%.

Conclusion:

qSOFA risk estimation for increased severity and adverse outcome can be enhanced by combining with the novel IMX-SEV-3 score.

Image :

		Clinical deterioration		
qSOFA group	SEV-3	no	yes	Incidence
Full cohort	High severity	14	7	33%
	Moderate severity	257	34	12%
	Low severity	251	5	2%
	All bands	522	46	8%
0-1	High severity	9	2	18%
	Moderate severity	230	28	11%
	Low severity	239	4	2%
	All bands	478	34	7%
2-3	High severity	5	5	50%
	Moderate severity	27	6	18%
	Low severity	12	1	8%
	All bands	44	12	21%

Distribution of patients over qSOFA and SEV-3 subgroups with corresponding proportion of patients reaching the composite endpoint "clinical deterioration".