Category :**Sepsis: biomarkers**

A268 - ***A novel transcriptomic host response classifier accurately predicts bacterial infections and 30-day mortality among critically ill surgical patients***

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Introduction:

Accurate identification of sepsis and prediction of its severity remains a clinical challenge. A 29-mRNA-host response classifier, IMX-BVN-3/SEV-3 (BVN/SEV-3) demonstrated excellent performance in identifying bacterial and viral infections and 30-day mortality in emergency department patients. Here we investigated the predictive performance of BVN/SEV-3 in surgical ICU patients.

Methods:

Patients were prospectively enrolled at ICU admission with either suspected sepsis (cohort A; n=52) or considered at-risk for sepsis (cohort B; n=137); 11 patients initially enrolled in Cohort B subsequently suspected of sepsis and were moved to an additional crossover cohort. BVN/SEV-3 was measured from whole blood sample (via NanoString nCounter) at cohort enrollment. Likelihoods of bacterial and viral infection and illness severity were determined by BVN/SEV-3 and its accuracy was compared with procalcitonin, IL-6, and sequential organ failure assessment (SOFA) scores.

Results:

Among 200 patients (median age 62.5 years) 30-day mortality was 3.6%, 15.4% and 18.2% in cohort A, B and crossover, respectively. Overall, BVN/SEV-3 had an area under the receiver operator curve (AUROC) of 0.84 [0.78-0.90] for diagnosing bacterial infection at time of enrollment, similar to procalcitonin (0.85 [0.80-0.91]) but significantly better than IL-6 (0.67 [0.59-0.76], $p<0.001$). BVN/SEV-3 predicted 30-day mortality with an AUROC of 0.81 [0.66-0.95], significantly better than IL-6 (0.57 [0.37-0.77], $p=0.006$), marginally better than procalcitonin (0.65 [0.50-0.79], $p=0.056$) and similar to SOFA (0.76 [0.62-0.91]). In patients with SOFA ≥ 6, BVN-3/SEV-3 high, moderate and low severity scores stratified mortality incidences to 36%, 6%, and 0%.

Conclusion:

BVN-3/SEV-3 accurately predicts infections and 30-day mortality in surgical ICU patients. With implementation as a rapid point of care test, BVN-3/SEV-3 could guide clinical care and improve resource utilization in critically ill surgical patients.