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A 29-mRNA molecular host response test demonstrates enhanced accuracy compared to a protein-based host response test for the diagnosis of bacterial and viral infections

04. Diagnostic microbiology
04d. Molecular diagnostics (incl POCT and syndromic testing)

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Background

Analyzing the immune response to acute infections can be used as a tool for the diagnosis of bacterial and viral tests independent of pathogen identification. We compared the performance of the TriVerity™ Test (Inflammatix), which can distinguish bacterial from viral and noninfected status, with the Liaison® MeMed BV® (Diasorin) test for the differentiation of bacterial and non-bacterial infections.

Methods

Whole blood (PAXgene® RNA tubes) and serum were collected from 867 subjects in a multicenter trial (SEPSIS-SHIELD) enrolling emergency department patients with suspected infection (NCT04094818). TriVerity measures expression of 29 host mRNAs on the Myrna™ Instrument. Myrna integrates RNA extraction, LAMP amplification, and result reporting via three (bacterial, viral, illness severity) scores in five discrete interpretation bands (very low, low, moderate, high, very high). MeMed BV test (performed on serum) measures three host proteins and generates a numeric score falling within discrete interpretation bands (HighVIR, ModVIR, EQV, ModBACT, HighBACT). The accuracy of bacterial and viral differentiation was evaluated against true infection status (clinical adjudication). AUCs, positive (PPA) and negative (NPA) percent agreement, and likelihood ratios (LR) were calculated for each test and compared to consensus adjudication (Yes or No infection).

Results

Among 867 subjects, 520 had consensus adjudication. Median age was 50 (18-90) years and 48.5% were female. 328 (63.1%) were adjudicated as bacterial, 113 (21.7%) viral, 3 (0.6%) co-infected, and 76 (14.6%) non-infected. TriVerity Bacterial AUC (bacterial infection) was 0.83 (80% CI 0.0.80-0.85), significantly higher than MeMed BV (0.76, 80% CI 0.72-0.78, p=0.0009). TriVerity Viral AUC (viral infection) was 0.93 (0.90-0.94), significantly higher than MeMed BV (0.69, 80% CI 0.65-0.73, p-value<0.0001). TriVerity's Bacterial Very High specificity was 96%; Memed BV (HighBACT) specificity was 69%.

Conclusions

TriVerity outperformed MeMed BV across both bacterial and viral classifications compared to clinically adjudicated infection status. These findings underscore the previously reported robustness of TriVerity in distinguishing between bacterial and viral infections and non-infected status.

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Molecular and rapid diagnostics
Keyword 2
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Host response
References, 300 characters, including spaces (if exceeding 300 characters please provide DOI number only) :
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Conflicts of interest

Do any of the authors have conflicts of interest related to the studies presented in this abstract?
Yes