Host-Protein Testing Increases Diagnostic Confidence for Immunosuppressed Emergency Department Patients.

Poster #8

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Introduction

Research Question: Can the addition of a diagnostic test that distinguishes bacterial from viral etiologies improve diagnostic confidence in **immunosuppressed (ISD)** patients presenting to the ED with SIRS criteria?

What's Known: A host bioarray (MeMed-BV®, MMBV) provides a rapid bacterial likelihood score using TRAIL, IP-10, and CRP; BV >65 (bacterial), <35 (viral).

Significance: Early bacterial vs. non-bacterial differentiation optimizes treatment, reduces antibiotic misuse, and improves patient flow. Can the addition of this adjunct diagnostic test improve diagnostic confidence early in ED management?

Knowledge Gap: Optimal methods for improving diagnostic certainty is evolving. Higher confidence in a specific diagnosis results in more appropriate tests, less waste, and more efficiency

Study Goal: Assess diagnostic certainty in **ISD patients** aided by BV test score

Methods

Randomized, single-center study compares standard of care (SOC) to an MMBV-revealed plus SOC arm.

Included: adults (≥18 years) presenting to the ED with SIRS and suspected infection (symptoms ≤7 days). Subset of ISD patients evaluated in blinded trial.

Attending providers recorded diagnostic certainty on a 10-point Likert scale (range of 1 to 10; 1 being minimally confident, 10 being highly confident) after initial assessment (t0) and after testing results (t1). SOC treatment vs. SOC plus MMBV test

Objectives: **Measure diagnostic certainty and its potential to improve further testing, therapies, and resources when the MMBV was revealed during initial lab results**. Statistics included Wilcoxon signed-rank tests for certainty changes and ANCOVA to adjust for baseline (t0) levels.

Results

- N=43 patients, balanced between SOC only (control) and SOC + MMBV reveal (study arm)
- Diagnostic certainty (confidence of diagnosis) increased in the MMBV (study) arm (median 1 unit increase in Likert confidence; IQR 0.0-2; p<0.001) but not in the SOC arm
- After adjusting for t0 levels, the study arm resulted in significantly higher physician reported confidence in diagnosis (beta = 1.01, 95% CI[0.26-1.76], p=0.009) than the control arm

	Median	IQR	p-value
MMBV (n=23)	Increase 1.0 unit	0.0-2.00	p < 0.001
SOC (n=20)	0.0	-0.2-1.0	p = 0.591

Machine Learning

TRAIL
TNF-Related Apoptosis-Inducing Ligand

CRP
C-Reactive Protein

IP-10
Interferon Gamma-Induced Protein 10

Elevated in **Viral** infections
Avg. Time to peak 0-6 hours

Elevated in **Bacterial** infections
Avg. time to peak 36-50 hours

Elevated in **infections**
Avg. time to peak 12 hours

10 < score < 35
Moderate
likelihood of viral infection (or other non-bacterial etiology)

65 < score < 90
Moderate
likelihood of bacterial infection (or co-infection)

V (Viral/Other)   0   10   35   65   90   100   **B** (Bacterial)

0 ≤ score ≤ 10
High
likelihood of viral infection (or other non-bacterial etiology)

35 ≤ score ≤ 65
Equivocal

90 ≤ score ≤ 100
High
likelihood of bacterial infection (or co-infection)

Conclusion

- The addition of the MMBV significantly increases physician confidence in diagnosing infection etiology in immunosuppressed (ISD) patients presenting with SIRS criteria.

- By providing higher assurance of bacterial or viral etiology early in the ED course, MMBV may reduce the perceived need for additional, low-yield diagnostic tests or therapies and streamline clinical decision-making for this high-risk population

- Further research with larger, diverse ISD populations is needed to assess potential trends.

References

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Questions?

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