Project Title

Syndromic Respiratory Testing: Evaluation of Biofire FilmArray Pneumonia Panel

Project Lead and Members

Joshua Lee, Nurasilah Ismail, Low Yuan Shen, Iris Lim Sing Pei, Yang Huina, Partha Pratim De, Pooja Rao

Organisation(s) Involved

Tan Tock Seng Hospital

Healthcare Family Group(s) Involved in this Project

Allied Health

Applicable Specialty or Discipline

Laboratory Medicine

Project Period

Start date: Not Available

Completed date: Not Available

Aims

To evaluate the role of the BioFire Pneumonia Panel in syndromic testing of respiratory infections

Background

See poster attached/ below

Methods

See poster attached/ below

Results

See poster attached/ below

Lessons Learnt

Not Available

Conclusion

See poster attached/ below

Project Category

Technology

Medtech

Care & Process Redesign

Productivity, Manhour Savings, Quality Improvement, Job Effectiveness

Keywords

Respiratory Infection, Microbiology, Specimen Testing, Polymerase Chain Reaction, Pathogens

Name and Email of Project Contact Person(s)

Name: Joshua Lee

Email: joshua_jt_lee@ttsh.com.sg

Syndromic respiratory testing
Evaluation of Biofire® FilmArray® pneumonia panel

Joshua Lee, Nurasilah Ismail, Low Yuan Shen, Iris Lim Sing Pei, Yang Huina, Partha Pratim De, Pooja Rao

Department of Laboratory Medicine, Tan Tock Seng Hospital

Tan Tock Seng HOSPITAL
National Healthcare Group

INTRODUCTION

Respiratory infections are a leading cause of mortality. Conventional microbiology methods require multiple different specimens for different testing platforms – blood, urine, and sputum are sent for culture, antigen detection, and PCR (polymerase chain reaction) analysis.

The BioFire® Pneumonia panel is a multiplex PCR system that identifies the 33 most common clinically relevant pathogens from a single specimen. We seek to evaluate the role this panel can play in the syndromic testing of respiratory infections.

METHODOLOGIES

We evaluated 18 sputum, 27 endotracheal aspirates (ETA) and 11 bronchoalveolar lavage (BAL) specimens from patients with pneumonia. The specimens were run concurrently on the BioFire® pneumonia panel and the standard of care multi-test approaches including culture, viral and atypical PCRs. Significance of bacterial organisms were determined using quantitative "binning" by BioFire® and concordance between routine laboratory testing methods (culture, viral PCR and PCR for atypical pathogens).

RESULTS

From the 56 specimens evaluated, the BioFire® panel identified a total of 77 bacterial pathogens compared to 24 from conventional respiratory cultures. *Legionella pneumophila* was detected with the multiplex panel and BioFire® from one ETA sample. Rhinovirus A/B/C was detected in a sample sent for respiratory virus multiplex PCR, no viruses were picked up by Biofire®.

42 of 56 specimens (75%) were concordant with the BioFire® panel and current laboratory testing. The highest concordance was observed in 10/11 BAL samples (91%) followed by 22/27 ETA samples (81%) while sputum samples showed the least concordance at 10/18 (56%).

CONCLUSION

The BioFire® Pneumonia panel complements culture for the identification of pathogens in the diagnosis of respiratory infections. This PCR panel may be leveraged to obtain a clinical diagnosis within hours compared to days or weeks that current diagnostic measures require. Particularly in the intensive care setting, earlier diagnosis will lead to early targeted clinical intervention, improving patient outcomes.

Having a single test platform also reduces manpower required for the processing of multiple tests on different platforms. Consolidating testing delivers value to the patient with greater convenience, timely results, and reduced healthcare costs.

Etiological agents of ventilator-associated pneumonia like *Stenotrophomonas maltophilia* and *Burkholderia cepacia* are not targeted by BioFire markers.

Further studies should include a larger sample size and clinical involvement in order to best evaluate findings.

FIGURES/ DIAGRAMS

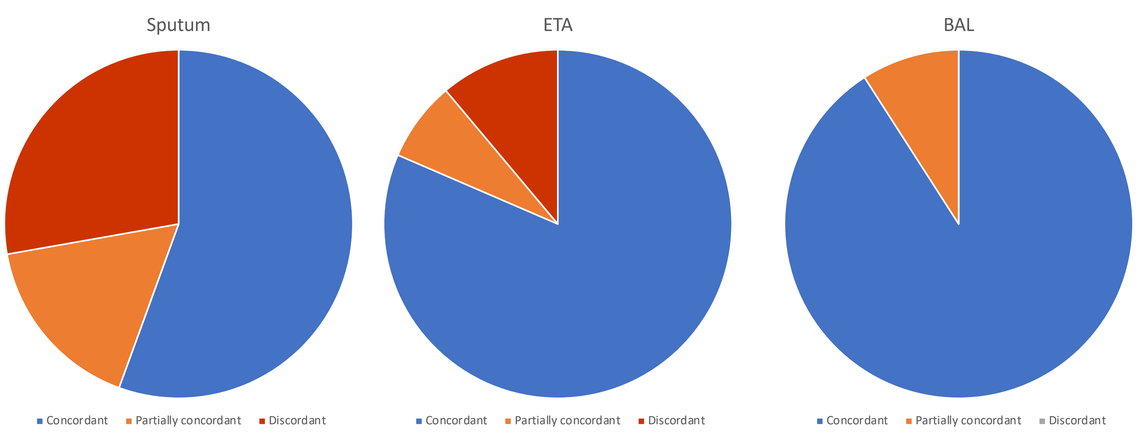

Figure 1: Concordance between routine laboratory testing and BioFire® across Sputum, ETA and BAL

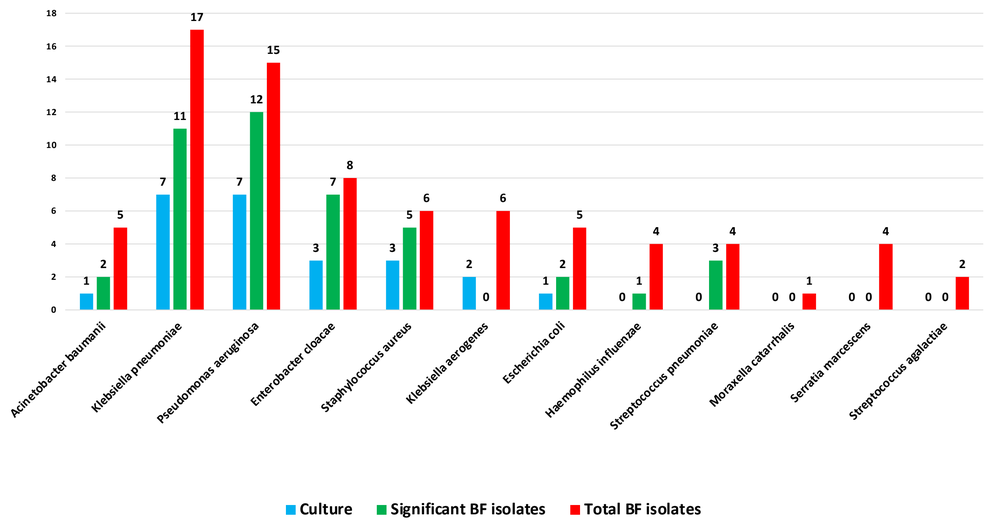

Figure 2: Detection rate of each observed bacteria isolates between culture and BioFire®