



Multiplex PCR Panel Improves the Detection and Antimicrobial Resistance Susceptibility of Respiratory Tract Pathogens in Hospitalized Patients

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Introduction

The infection of respiratory tract pathogens may extend the inpatient days of hospitalized patients. However, the excessive usage of antibiotics leads to pathogens which acquired resistance. Hence, the quick and precision detection of the types and antibiotic sensitivity of causative agents for hospitalized patients is essential. Nowadays, the diagnostic approaches include standard culture, molecular typing and antigen detection. However, the current analytics is limited by low sensitivity and long turnaround times. In this study, we utilized the BioFire FilmArray pneumonia panel (PN panel) to compare the performance with standard testes in hospitalized patients.

Methods

We analyzed the targeted pathogens and antimicrobial resistance markers by PN panel from hospitalized patients. Subsequently, we compared the detection results with those of culture methods and antibiotics susceptibility testing.

Results

The endotracheal aspirates and sputum specimens came from 806 hospitalized patients, 476 patients (59.0%) were positive by PN panel assay and multiple pathogens were detected by PN panel in 241 patients (29.9%) (Table 1.). The panel detected A. *calcoaceticus-baumannii* complex and P. *aeruginosa* most frequently, followed by K. *pneumoniae* group, S. *aureus* and E. *coil* (Fig. 1). We further analyzed 186 patients with the expression of antimicrobial resistance markers. The percentage of the pathogens were detected both in PN panel assay and standard culture was 52.6% (98/186). Moreover, the antibiotics susceptibility testing from 83 patients (44.6%) were actually concordance with antimicrobial resistance gene expression (Fig. 2). Besides, the numbers of pathogens from PN panel in 153 patients (82.2%) were higher than from standard culture (Fig. 3).

No. of pathogens in FilmArray PN Panel result	Specimens (n=806)	% of total
Detected	476	59.06
One	235	29.16
Тwo	123	15.26
Three	69	8.56
Four	29	3.60
Five	16	1.99
Six-Night	4	0.49



Table 1. Total number of PN Panel-positive specimens



Fig 2. The percentage between PN panel-detected and routine- cultured pathogens



Total=186

Fig 1. Top 10 of detected pathogens from PN panel Fig 3. Concordance rate of bacterial analytes detected by PN panel and routine culture

Conclusion

The more detected pathogens from PN panel may remind the further investigating antibiotic sensitivity and provide the considerable prescription of antibiotics.

References

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