2033. Evaluation of the FilmArray Meningitis/Encephalitis Molecular Panel in a Tertiary Care Public County Hospital

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Background. Rapid diagnosis and treatment of meningitis and encephalitis is critical to reduce morbidity and mortality. The Biofire FilmArray Meningitis/Encephalitis (ME) Panel is a rapid, multiplex PCR assay that targets 14 common bacterial, fungal, and viral agents of ME. To our knowledge, there are no published studies evaluating the ME Panel's impact on clinical decision-making.

Methods. Retrospective chart review was performed on 100 consecutive cases from January through April 2017 who underwent testing with the ME Panel. ME Panel results were compared with conventional testing methods. Each case was categorized as either contributory (n = 51), possibly contributory (n = 13), or noncontributory (n = 36) based upon clinicians' acknowledgement and utilization of ME Panel results. Duration of ME antimicrobial therapy (bacterial, viral, and/or fungal) was determined for each case.

Results. The average patient age was 41.1 years, with 37% of cases having either a new or established HIV diagnosis at the time of testing. The average turn-around time to reporting was 3.7 hours. The ME panel was positive in seven cases and demonstrated 100% sensitivity and 100% clinical specificity. During the study period, ME Panel raised infections with varicella-zoster virus, Cryptococcus neoformans in three different patients, Listeria monocytogenes, enterovirus, and Streptococcus pneumoniae. The ME panel detected L. monocytogenes and S. pneumoniae despite antibiotic therapy prior to lumbar puncture. The CSF cultures were subcultured and negative. Positive blood cultures were not available. Duration of antibiotic therapy was significantly decreased in the contributory and possibly contributory cases compared with noncontributory cases (28.38 hours vs. 76.69 hours, P = 0.04). Although not statistically significant, similar reductions were observed in duration of antimicrobial therapy (P = 0.04).

Conclusion. The FilmArray ME Panel demonstrated high sensitivity and specificity during the study period and was capable of detecting infections that would only have been diagnosed by blood culture. Duration of therapy was reduced in patients where the ME panel was contributory to clinical decision-making.

Disclosures. S. M. Butler-Wu, Biofire Diagnostics: Consultant, Consulting fee

2034. Meningitis Susceptibility Testing of Enterobacteriaceae by Agar Dilution (AD), Broth Microdilution (BMD) and Polymyxin NP

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Session: 234. Diagnostics - Bacterial Identification and Resistance Saturday, October 7, 2017: 12:30 PM

Background. Polymyxin resistance among Enterobacteriaceae is increasingly reported worldwide, with plasmid-mediated colistin resistance, conferred by mcr-1, recently reported. In 2017, CLSI set colistin Epidemiological Cutoff Values (ECVs) for Enterobacteriaceae. There are limited accurate methods for colistin susceptibility testing. The use of rapid dilution NP (PRNP) test detects bacterial growth in the presence of colistin. We evaluated AD and BMD in comparison to PRNP using clinical isolates of Enterobacteriaceae, which we also tested for mcr-1. We additionally gathered colistin MIC data among Enterobacteriaceae isolates over a period of 6 years.

Methods. Colistin MICs were determined by BMD and AD for 100 clinical isolates of Enterobacteriaceae submitted to our laboratory from August 2016 to February 2017. mcr-1 testing was performed via a laboratory developed real-time PCR assay on a LightCycler 480 platform. PRNP was also performed. Colistin MIC distributions, determined using AD, were reviewed for all isolates of Enterobacteriaceae submitted to our laboratory from 2011 to 2017 after excluding species with intrinsic resistance to colistin.

Results. With BMD as the reference method, the essential and categorical agreement of AD was 86.1% and 97.9%, respectively. The very major and major error rates for AD were 2.5% (1/40) and 2.9% (1/34), respectively. Sensitivity and specificity of PRNP were 90.7% and 94.1%, respectively. One isolate tested positive for mcr-1 (Escherichia coli, MIC ≥ 4 µg/mL by AD and BMD and positive PRNP). Excluding species with intrinsic resistance to colistin, 1153/48,441 isolates (2.4%) had colistin MICs ≥ 4 µg/mL. More isolates of enterobacteria complex, Klebsiella pneumoniae and E. coli were the most common species with colistin MICs ≥ 4 µg/mL (by AD). 2.7% (31/1153) of isolates with colistin MICs ≥ 4 µg/mL (by AD) were also resistant to a carbapenem; K. pneumoniae of the most common species with concomitant colistin MICs ≥ 4 µg/mL by AD and carbapenem resistance.

Conclusion. A low percentage of isolates surveyed over the past 6 years demonstrated elevated MICs to colistin by AD. AD did not meet essential agreement criteria for colistin susceptibility testing. PRNP was found to have good sensitivity and specificity when compared with BMD.

Disclosures. R. Patel, ASM: Board Member, None CD Diagnostics, BioFire, Curetis, Merck, Hutchison Biopharmaceutical Medical Solutions, Accelerate Diagnostics, Ellure, and The Medicines Company: Grant Investigator, Grant recipient

2035. Significant Reduction of Blood Culture Contamination in the Emergency Department (ED) Using the SteriPath® Blood Diversion Device

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Session: 234. Diagnostics - Bacterial Identification and Resistance Saturday, October 7, 2017: 12:30 PM

Background. Contaminated blood cultures are a particular problem in EDs and often lead to unnecessary antibiotic treatment. A potential approach to reduce contamination is to discard the initial aliquot of blood which is often contaminated with skin plugs and bacteria. To test this approach, we performed a study using the SteriPath® (SP) device (Magna Medical Technologies, WA) a pre-assembled, sterile blood culture system designed to divert the initial 1.2–2.0 mls of blood prior to bottle inoculation.

Methods. This was a pre-post intervention study conducted in the ED at Rush University Medical Center, Chicago. During the pre-intervention phase (1 September to 30 November 2015), 2 sets of peripheral blood cultures were collected using a standard aseptic technique by nurses in the ED. Skin antisepsis was performed with Chloraprep® and 5–10 mls of blood was inoculated into BacT Alert SA and SN bottles (BioMerieux). During the intervention phase (1 February to 1 May 2016), blood cultures were collected using the SP device. All bottles were incubated for 5 days and rates of blood culture contamination were compared between control and intervention periods.

Results. Classification of blood culture contamination was based on standard CLSI criteria. During the control phase, 929 sets of blood cultures were collected in the ED. A total of 40/929 sets (4.3%) from 36 patients were identified as contaminations and 81 sets (8.7%) from 51 patients were identified as true bacteremia. The contaminants included: 29 sets (72.5%) coagulase negative Staphylococcus spp. (CoNSs), 4 sets (10%) Micrococcus spp., 3 sets (7.5%) Corynebacterium spp., 2 sets (5%) alpha-hemolytic Streptococci spp., 1 set (2.5%) each Bacillus spp. and Enterococcus spp. During the intervention phase, 3/539 (0.6%) sets of blood cultures from 3 patients were contaminated (P < 0.001). The 3 contaminates were 1 CoNS, 1 alpha-hemolytic Streptococcus spp. and 1 Corynebacterium spp. 49 sets (9.1%) from 35 patients were identified as true bacteremia.

Conclusion. The use of the SP device in the ED over a 3-month period significantly reduced the rate of blood culture contamination from 4.3% to 0.6% while the rates of true bacteremia remain unchanged. The SP device represents a simple and effective method for reducing blood culture contamination.

Disclosures. All authors: No reported disclosures.

2036. Combined Bacterial Identification and Antimicrobial Susceptibility Testing Directly from Whole Blood

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Session: 234. Diagnostics - Bacterial Identification and Resistance Saturday, October 7, 2017: 12:30 PM

Background. Timely identification of a causative pathogen and its antimicrobial susceptibility profile is important for effective therapy. This is especially true in the case of bloodstream infections caused by the ESKAPE (Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumannii, Pseudomonas aeruginosa, and Enterobacter cloaca) pathogens where inappropriate antibiotic prescription often leads to higher mortality and increased selection for multi-drug resistant organisms. However, current standard protocols for pathogen identification (ID) and antimicrobial susceptibility testing (AST) take days to complete and despite the advancement of molecular diagnostics, none can concurrently provide reliable ID and AST information.

Methods. We developed a method of direct ID and AST of ESKAPE pathogens using real-time PCR-HRM (high resolution melt) as the end-point analysis coupled with whole blood sample preparation. Our assay utilizes blood cell lysis, removal of background human DNA and protein, pathogen enrichment, antibiotic exposure, and broad range PCR-HRM to target pathogen internal transcribed spacer region to determine ID and AST in less than 10 hours. We then assessed microbicide