213. Successful Implementation of BCID Across Large Healthcare System Using a Central Testing Laboratory and Multidisciplinary Pharmacy Team

Monday, October 7, 2017: 9:30 AM

Background. BCID testing was implemented over a 2-month period. A multidisciplinary team developed standard protocols for processing, transport and testing, with communication of results across teams of stewardship pharmacists. Standard algorithms were used across all facilities to guide antibiotic prescribing. Data were collected between January and May 2017 from three sources (BacTec, TheraDoc and Cerner EMR). Positive bottles were tracked from the time of the positive bottle alert through pharmacist intervention. We evaluate rates of interventions and consistency using variance comparison tests.

Results. 79% of blood cultures were identified at 3 acute care facilities and testing used BCID. TAT from positive bottle to BCID result was 4.6% (95% CI 4.4–4.8) hours. 86.7% (614/708) were on appropriate empiric antimicrobials at the time of the BCID result. 28.0% (198/708) required a recommendation by a pharmacist. 39.6% (78/197) had an escalation recommendation while 26.4% (52/197) had a de-escalation recommendation. There was no significant variation across shifts or sites except with de-escalation where variation was greater than 10% across sites (P = 0.02).

Conclusions. BCID testing was successfully implemented across a large integrated healthcare system using central testing laboratory paired with a team of stewardship and virtual care pharmacists. Our strategy provided timely and reproducible results across facilities and shifts. Implementation of BCID allowed for more pathogen directed therapy at all facilities with variability in need for escalation and de-escalation of therapy better.

Disclosures. No reported disclosures.

2132. Evaluation of the Clinical Impact of the Biofire FilmArray® Rapid Multiplex PCR Assay in Blood Culture Identification Combined with Antimicrobial Stewardship Intervention

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Session: 240. Stewardship: Impact of Diagnostics
Saturday, October 7, 2017: 12:30 PM

Background. Bloodstream infections are a major cause of morbidity and mortality worldwide, with favorable clinical outcomes associated with early optimal antibiotic selection. Rapid diagnostics have become a key part in achieving this, Biofire FilmArray assays have been demonstrated to improve identification of rare organisms, in particular pathogens important in outbreaks. Our objectives were to (1) report outcomes in patients with bloodstream infections (BSIs) identified through the use of the Biofire FilmArray assay, (2) describe the clinical performance of this test by examining available clinical information, test results and the impact on patient management.

Methods. We performed a single-center retrospective cohort study of patients who had a universal PCR result from August 2013 to April 2016. Clinical data were extracted from medical records. Odds ratios were calculated and patients testing positive/negative were compared with univariate logistic regression.

Results. 71 tissue samples were included, of which 21 (29.6%) were positive. 12 bacteria, 3 mycobacteria and 7 fungi were identified. The number of leukocytes in the Gram stain (odds ratio, OR 1.57, 95% CI 1.02–2.41, P = 0.04) and presence of inflammation on histopathological examination (OR 5.69, 95% CI 1.02–30.40, P = 0.03) were found to be significantly associated with a positive result. The sensitivity, specificity, positive predictive value and negative predictive values were calculated by comparing the test result with a gold standard composite final clinical diagnosis determined by 3 independent reviewers based on all available clinical information.

Conclusion. This study suggests that the universal PCR assay has significant clinical utility, but the yield of this test can be optimized by careful patient/specimen selection. Utility was highest in patients with microscopic evidence of inflammation by gram stain or histopathological examination. Specificity was high. The use of this complex, difficult to interpret, and expensive test should be limited to infectious disease physicians incorporating all available clinical information to optimize performance.

Disclosures. No reported disclosures.

2134. Impact of Accelerate Pheno System on Time to Antimicrobial Stewardship Intervention in Patients with Gram-Negative Bloodstream Infections

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Background. Rapid diagnostic tests in combination with antimicrobial stewardship interventions have been reported to improve antimicrobial de-escalation rates in patients with blood stream infections (BSIs). The Accelerate Pheno™ System (APS) has a potential advantage over many currently approved rapid diagnostic tests due to its ability to identify 7 bacteria, 3 mycobacteria and 7 fungi in under 4 hours. The aim of this study was to assess the clinical utility of this test in real-world clinical practice. The aim of this study was to assess the clinical performance of this test by examining available clinical information, test results and the impact on patient management.

Methods. We performed a single-center retrospective cohort study of patients who had a universal PCR result from August 2013 to April 2016. Clinical data were extracted from medical records. Odds ratios were calculated and patients testing positive/negative were compared with univariate logistic regression.

Results. 71 tissue samples were included, of which 21 (29.6%) were positive. 12 bacteria, 3 mycobacteria and 7 fungi were identified. The number of leukocytes in the Gram stain (odds ratio, OR 1.57, 95% CI 1.02–2.41, P = 0.04) and presence of inflammation on histopathological examination (OR 5.69, 95% CI 1.02–30.40, P = 0.03) were found to be significantly associated with a positive result. The sensitivity, specificity, positive predictive value and negative predictive values were calculated by comparing the test result with a gold standard composite final clinical diagnosis determined by 3 independent reviewers based on all available clinical information.

Conclusion. This study suggests that the universal PCR assay has significant clinical utility, but the yield of this test can be optimized by careful patient/specimen selection. Utility was highest in patients with microscopic evidence of inflammation by gram stain or histopathological examination. Specificity was high. The use of this complex, difficult to interpret, and expensive test should be limited to infectious disease physicians incorporating all available clinical information to optimize performance.

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hours (95% CI 11.5–24.6) for 8 hour stewardship coverage. When stewardship coverage was extended to 16 hours, the mean decrease in time to ASTEW-I with APS was 21.4 hours (95% CI 14.3–28.5). Both time differences were found to be statistically significant (P < 0.001).

Conclusion. In a cohort of patients with Gram-negative bacteremia, when compared with ASTEW-I guided by APS significantly shortened the time to potential antimicrobial optimization. This improvement occurred even when antimicrobial stewardship support was limited to an 8 hour work day.

Figure 1: Protocol with simulated time difference for 8 hour stewardship service

2135. Direct Disk Diffusion Susceptibility Testing for Gram-negative Bacteria from Blood Cultures: Diagnostic Accuracy and Impact on Antimicrobial Stewardship
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Background. In order to detect multidrug resistant (MDR) bacteria, our laboratory routinely performs direct susceptibility (DS) testing from positive blood cultures. We conducted a prospective study to determine the accuracy, reporting time (RT), and antimicrobial stewardship impact of DS testing for Gram-negative bacilli (GNB) positive blood cultures.

Methods. From March – December 2016, first time positive blood cultures for GNB were included in the study. broth from positive blood culture bottles was inoculated to standard media, as well as to Mueller–Hinton agar with cefoxitin (FOX), amoxicillin/clavulanic acid (AMC), ceftriaxone (CRO), ceftazidime (CAZ), ciprofloxacin (CIP) and meropenem (MEM) disks. The CRO and CAZ were adjacent to the AMC disk, which enabled detection of zone-enhancement with extended-spectrum β-lactamase (ESBL) producing organisms. CLSI breakpoints were used to guide interpretations of the DS results. Antibiotic therapy changes, made based on verbal reporting of DS results, were recorded. In order to determine RT, the following time points were recorded: blood culture positivity, reading of DS, and reporting of standardized susceptibilities (SS).

Results. There were 105 unique, monomicrobial cultures consisting of: E. coli (N = 61), Klebsiella sp. (N = 15), Enterobacter sp. (N = 9), Proteus sp. (N = 5), Pseudomonas aeruginosa (N = 5), and 10 other miscellaneous GNB. RT was reduced from 38 to 22 hours, for SS and DS, respectively. For species with CLSI breakpoints (101 isolates), the major antibiotic resistance rates were: amoxicillin/clavulanate (94.1%), AMC (72.7%), CRO (65.3%), CAZ (54.9%), CIP (44.3%), and MEM (36.5%). The majority of antimicrobial changes were for MRSA (91%), 55% for ESBL, and 54% for MRGN. The median number of SAM changes was 2 (IQR 1–3). The median number of DS changes was 1 (IQR 1–2), with 26/27 isolates correctly identified. DS results changed antibiotic management for 23 (major and minor errors for all antibiotics were 2% and 20%, respectively; 17% of isolates had major and minor errors).

Conclusion. DS-intermediate and SS-susceptible (minor error). CIP disk testing identified all isolates correctly in 26/27 isolates. DS results changed antibiotic management for 23 patients. DS results were available 24 hours before SS.

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2136. Effect of the Methicillin-Resistant Staphylococcus aureus Nasal Polymerase Chain Reaction on Vancomycin Days and Clinical Outcomes in Pneumonia Patients
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Session: 240. Stewardship: Impact of Diagnostics
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Background. Previous studies have demonstrated that the methicillin-resistant Staphylococcus aureus (MRSA) nasal polymerase chain reaction (PCR) assay has a high negative predictive value for MRSA pneumonia, and that a negative result may be used to guide antibiotic de-escalation. Despite increasing use in clinical practice, limited data exist regarding the impact of nasal MRSA testing on the duration of MRSA-directed therapy and patient outcomes. This study evaluated the effect of the MRSA nasal PCR result on vancomycin days and clinical outcomes in patients treated for pneumonia with empiric vancomycin therapy.

Methods. A retrospective study of adult inpatients with an MRSA nasal PCR assay ordered between January 2015 and September 2015 was conducted. Patients with confirmed or presumed pneumonia and who were treated with empiric vancomycin therapy were included. Outcomes were compared for patients with a negative vs. a positive MRSA nasal PCR result. The primary outcome was the number of days of vancomycin therapy. Secondary outcomes included restart of vancomycin within 7 days, length of hospitalization, 30-day readmission, 30-day mortality, and predictive value of the MRSA PCR assay. Analyses were performed for the overall cohort and a propensity score-matched cohort.

Results. 324 patients were included. In the overall cohort, the median duration of vancomycin therapy was 3 (interquartile range [IQR] 2–6) days in the negative MRSA nasal PCR group (n = 282) and 6 (IQR 4–9) days in the positive nasal PCR group (n = 42). P < 0.01. In the propensity score-matched cohort, the median number of vancomycin days was 3 (IQR 2–5) and 5 (IQR 4–8) in the negative (n = 137) and positive (n = 39) nasal PCR groups, respectively. P < 0.01. This difference persisted in an additional analysis of only patients with no positive respiratory cultures. No significant differences were observed in any secondary outcomes. The MRSA PCR assay demonstrated a positive predictive value of 45% and a negative predictive value of 98%.

Conclusion. A negative MRSA nasal PCR correlated with fewer days of vancomycin therapy without negatively impacting other clinical outcomes. The use of the MRSA nasal PCR assay may reduce the duration of MRSA-active therapy in PCR-negative patients.

Disclosures. All authors: No reported disclosures.

2137. Influence of T2 Candida Testing for Rapid Diagnosis of Candidiasis Infections on Antimicrobial Stewardship Efforts at a Large Academic Medical Center: A Retrospective, Single-center Study
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Background. Antimicrobial stewardship has traditionally focused on the optimal use of antibacterial agents. Much less attention is focused on the optimal use of antifungal therapy (AFT). The high mortality and emergence of resistance in invasive infections due to Candida presents a critical opportunity for AFT stewardship. The T2Candida (T2C) panel is a rapid diagnostic test using magnetic resonance to detect 5 different species of Candida in whole blood. T2C has a sensitivity of 91%, specificity of 99%, negative predictive value of 99%, and generates results in <6 hours.

Methods. We conducted a retrospective analysis of candidemia cases at the UAB Medical Center in 2015–16. T2C testing was introduced in January 2016. We compared outcomes among patients prior to and following the implementation of routine T2C testing. The focus of the study was to gather data on AFT time to initiation of therapy (TTT), and overall use of echinocandin patterns during the study period utilizing days of therapy (DOT) /1000 pt days as a parameter.

Results. In 2015 and 2016, 100 patients and 138 patients with candidemia, respectively, were included in the analysis. In 2016, there were 354 T2C valid results; 36 (10.2%) were positive and 318 (89.8%) were negative. The TTT for all candidemic patients in 2015 was 2.02 days vs 1.15 days for candidemic patients in 2016, including all who were blood culture (BC+) and/or T2C+ (P < 0.0001). For patients with candidemia in 2014, TTT in the T2C+ group vs those in whom only BC+ was 0.99 days and 1.69 days, respectively (P < 0.00001). Comparing results for 2015 and 2016, we observed echinocandin (ECH) usage of 15.1 and 17.8 DOT/1000 pt days, respectively.

Conclusion. We observed a significant decrease in the TTT for candidemic patients since introduction of the T2C. These results suggest that rapid identification of candidemia may be an important tool for AFT stewardship. We hypothesize that other factors, such as the updated IDSA Treatment Guidelines for Candidiasis and increased attention to the early intervention for sepsis campaign, may have influenced the use of ECH, and is supported by the observation that along with the decrease in TTT, we observed a slight increase in the DOT/1000 pt days between 2015 and 2016, suggesting more liberal use of empiric ECH.

Disclosures. All authors: No reported disclosures.

2138. Effect of Rapid Molecular Diagnostic Testing and Antimicrobial Stewardship on Antimicrobial Therapy of Respiratory Infections
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