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Session: 230. Diagnostics: Mycology
Saturday, October 6, 2018: 12:30 PM

Background. Candida species are the fourth leading cause of nosocomial bloodstream infections in the United States. Unfortunately, detection, identification and susceptibility testing using standard instrumented blood culture systems and routine microbiological techniques may take 4–10 days. Moreover, sensitivity of routine blood cultures for candidemia is only ~50 to 75%. The T2 Candida Panel (T2CP) is an FDA-approved assay that rapidly detects the presence of five Candida species directly from whole blood in 3–5 hours. We examined mortality and antifungal therapy (AFT) decisions based on positive (pos) results of a T2CP in patients with negative (neg) blood cultures.

Methods. We performed a case series of all patients who had a pos T2CP with concomitant neg blood cultures at our institution from March 1, 2016 to March 1, 2018. If a patient had multiple valid T2CP, only the first pos result was used for analysis. Medical records were reviewed for demographics, comorbidities, risk factors for candida infection, length of stay, use and duration of AFT, and 14-day and in-hospital mortality from the time of the T2CP.

Results. Fifteen patients were identified who met inclusion criteria. Eight patients were immunocompromised: four (26.7%) solid cancer malignancy, three (20%) hematologic malignancy, and one kidney transplant recipient. Pos T2CP results by species were as follows: 53.3% C. albicans/C. tropicalis, 40% C. parapsilosis, and 6.7% C. glabrata/C. krusei. Median SOFA, Charlson comorbidity index, and Candida scores were 6, 6, and 9, respectively. Fourteen-day mortality was 40% and in-hospital mortality was 53.3%. Only two patients (13%) were on prophylactic AFT due to an echi-nocandin response to the pos T2CP. Of the remaining 13 patients who were not on prophylactic AFT, all were started on AFT after pos T2CP result.

Conclusion. Suspected or positive AFT therapy based on pos T2CP in severely ill patients who had negative blood cultures. Unfortunately, the population had high severity index scores and high mortality despite initiation or escalation of AFT. We hypothesize that earlier testing and detection of Candida fungemia may lead to faster initiation of AFT and better outcomes.

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2055. Utility of Aspergillus Galactomannan Assay in Allogeneic Stem Cell Transplant Recipients
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Session: 230. Diagnostics: Mycology
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Background. Allogeneic hematopoietic stem cell transplantation (HSCT) is a valuable treatment option for patients with some blood/malignant disorders. However, this procedure may be complicated by life-threatening infections, including invasive aspergillosis (IA). Diagnosis of IA is challenging due to nonspecific symptoms that present similar to other infections; and delays in initiation of treatment are associated with poor outcomes. The galactomannan assay (GM) is a widely used test for the early diagnosis of IA and allows for prompt initiation of antifungal therapy. However, a positive (+) GM result requires further workup for a definitive diagnosis. Furthermore, false-positive results can lead to unnecessary treatment with expensive and potentially toxic antifungal medications. At UC San Diego Health, allogeneic HSCT patients not on mold-active agents for antifungal prophylaxis have GM tested weekly until 100 days post-HSCT. This study aims to describe the sensitivity and specificity of GM testing in this HSCT population.

Methods. This is a retrospective single-center study of patients >18 years of age post-allogeneic HSCT at UC San Diego Health from January 2015 to December 2016 with GM results reported in the electronic medical record. Data includes patient demographics, GM results up to 100 days post-HSCT, antifungal prophylaxis, further testing performed, diagnosis of possible, probable and proven IA, and outcome of infection.

Results. In total, 108 patients met criteria for enrollment in this study. There were a total of 1,354 GM results, of which only 2.8% (38) were positive (≥1 GM) in 25 patients (23% of all patients). Of these, 20 of 25 (80%) were found to be false-positives. In total, 108 patients were diagnosed with probable IA. Of these, 90 patients had 0+GM, and two had 1+GM. In the two with 1+GM, IA diagnosis was notably made prior to the >GM result. In only three of the seven cases did ≥GM screening lead to diagnosis of IA; of these, two patients had acute GVHD and one developed infection during neutropenia, in the first 2 weeks post-HSCT.

Conclusion. Routine GM testing adds to cost and is not a useful predictor of IA infection in the studied population. Studies to determine what populations, if any, would most benefit from routine pre-emptive GM or other fungal screening are needed.

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2056. Trypanosoma cruzi DNA Detection by PCR in Dried Blood Spots Preserved in Filter Paper
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Session: 231. Diagnostics: Parasitology
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Background. Early diagnosis of Congenital Chagas Disease is important to initiate efficient treatment, so it is necessary to develop techniques with lower detection limits and greater specificity than PCR. The lack of validated protocols and the need to send samples to be analyzed in experienced centers makes dried blood spots preserved in filter paper an attractive alternative for the conservation and handling of samples. The aim of this study was to optimize the detection of Trypanosoma cruzi DNA from dried blood spots preserved in filter paper.

Methods. Fixed sections of Whatman filter paper with different concentrations of T. cruzi were prepared (10^3/mL to 10^7/mL) and stored at room temperature, 4 and ~20°C in the presence or absence of a desiccant. Samples (8 mm) were taken at 7, 60, 90 and 240 days of preservation. Endpoint PCR, targeting 185 gene, was used for the detection of T. cruzi DNA directly on the filter paper.

Results. T. cruzi DNA was detected at all sampling times up to the 10^7/mL concentration independently of conservation. The effect of humidity was observed at 240 days preservation with the observation of faded bands in agarose gels. For the 10^3/mL concentration, T. cruzi DNA was detected only at 7 days regardless of preservation. When comparing T. cruzi DNA detection using increasing sections of filter paper (8, 16 and 24 mm), T. cruzi DNA was detected in all areas tested in the concentration of 10^7 parasites/mL and only when using 24 mm for the concentration of 1 parasite/mL. Our data suggests that dried blood spots preserved in filter paper by endpoint PCR in the different conservation conditions up to 8 months. The detection of parasite DNA was improved by increasing the area of filter paper tested. The conservation of blood on filter paper would provide a safe transport of samples at room temperature to distant specialized laboratories to perform diagnostics using molecular techniques.

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Conclusion. Our analysis suggests that age and household exposure predict higher likelihood of protozoal infection in children with AGE. Classic epidemiologic exposures including travel and recreational water exposure were not predictive. These data could improve appropriate test selection. Future studies are still needed for external validation of this model.

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2058. Comparison of Drug Resistance Rates of Mycobacterium tuberculosis by the Conventional Drug Susceptibility Test and Sequencing Method
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Session: 232. Diagnostics: Resistance Testing
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Background. Tuberculosis (TB) is caused by Mycobacterium tuberculosis and is among the top 10 causes of death worldwide. Multidrug-resistant TB is increasing, with almost 480,000 new cases. According to drug resistance surveillance data, 3.9% of these are new cases and 21% previously treated TB cases. The aim of this study was to compare the results from the conventional drug susceptibility test (DST) and the sequencing method.

Methods. The study included 122 individuals with TB. Drug susceptibility was tested by the conventional DST and sequencing. We calculated the drug resistance rate of each anti-tuberculosis agent and compared the resistance pattern according to each method.

Results. The resistance rates by conventional DST were 6.3, 9.4, 3.1, 7.0, 0.8, and 4.8% for rifampicin, isoniazid, streptomycin, ethambutol, fluoroquinolones, and pyrazinamide, respectively, in the newly diagnosed group, and 4% for both isoniazid and fluoroquinolones in the previously treated group. The resistance rates by sequencing were 9.3, 3.2, 7.2, 0.8% for rifampicin, isoniazid, ethambutol, and pyrazinamide, respectively, in the newly diagnosed group and 21.1, 28.6, 5.0, and 13.0% for rifampicin, isoniazid, streptomycin, and pyrazinamide, respectively, in the previously treated group. The concordance rates of isoniazid were 70% for resistance and 95% for susceptibility; rifampicin; 80% for resistance and 98% for susceptibility; ethambutol; 98% for susceptibility; pyrazinamide, 17% for resistance and 96% for susceptibility; streptomycin, 98% for susceptibility; and fluoroquinolones, 98% for susceptibility.

Conclusion. The resistance patterns of rifampicin, isoniazid, and pyrazinamide by both methods were analogous to each other in the newly diagnosed group. In addition, the concordance rates of drug susceptibility were high. Therefore, it is helpful to compare the results from the conventional DST and sequencing method for more precise detection of drug resistance of M. tuberculosis.

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2059. Comparative Evaluation of Cefatoloreline Susceptibility Methods in Clinical Isolates of Methicillin-Resistant Staphylococcus aureus (MRSA): Results from a Multicenter Study
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Background. Cefatoloreline (CPT) is a last generation cephalosporin with activity against beta-lactamase producing Enterobacteriaceae. We aimed to evaluate the results of CPT susceptibility testing with Etest by MALDI-TOF and susceptibility testing of all isolates was performed at a central laboratory. CPT susceptibility using KB catalogued 38 (95%) isolates as susceptible and only 2 as intermediate. No CPT-R strains were found by Etest or KB. The CA was for Etest and KB, respectively; Etest's EA was 80%. Worryingly, out of 14 CPT-R isolates by BMD, 6 were deemed susceptible by Etest and 12 by KB, obtaining VME rates of 43 and 87%, respectively.

Conclusion. Performance of both Etest and KB to assess CPT susceptibility in MRSA isolates from Chile was poor, with a unacceptably high proportion of VME, and a CA lower than 50% for both techniques. Correlation of CPT susceptibility with the molecular epidemiology of the isolates is currently being performed.

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2060. Comparison of Plazomicin MIC Test Strip and Broth Microdilution MIC Results for 125 Enterobacteriaceae
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Background. Plazomicin (PLZ) is a next-generation aminoglycoside with in vitro activity against MDR Enterobacteriaceae, including CRE. PLZ is currently under review at the FDA for the treatment of complicated urinary tract infections, including pyelonephritis, and bloodstream infections due to certain Enterobacteriaceae in patients with or without a prior treatment option. The study was performed to evaluate the performance of a newly developed gradient strip, the plazomicin MIC Test Strip (MSTR) from Liofichelm, Roseto degli Abruzzi, Italy compared with the broth microdilution method against relevant Enterobacteriaceae.

Methods. The study isolates included 125 Enterobacteriaceae (12 species as shown in the table), which were chosen to include a range of plazomicin MICs and isolates with known resistant mechanisms. Each isolate was tested for PLZ MIC by broth microdilution (BMD; LSI prepared frozen panels) and by PLZ MTS on 100 mm diameter plates (Remel Dickinson, Sparks, MD) and a subset of 20 strains was also tested on MHA plates from two additional manufacturers (Hardy, Santa Maria, CA and Remel, Lenexa, KA). Quality control (QC) strains (E. coli ATCC 25922 and P. aeruginosa ATCC 27853) were tested on each day of testing and results compared with CLSI expected ranges.

Results. As shown in the table, PLZ MTS and BMD results were within ±1 doubling dilution (essential agreement) for 99.2% of all study isolates. The category agreement rate was 91.2% (based on proposed susceptible/intermediate/resistant breakpoints of 0.5/2/16 µg/mL) and there were no very major or major errors observed. The QC results were within CLSI published ranges. PLZ results for MSTR tested on Remel and Hardy MHA for the subset of 20 isolates were similar to BD MHA results (essentially equal or 1 dilution lower).

Table. Comparison of Plazomicin MIC Results (Frequency Distribution of Dilution Difference, MTS MIC–BMD MIC)

| Organism          | −2 | −1 | 0 | 1 | 2 |
|-------------------|----|----|---|---|---|
| Citrobacter spp.  |    |    | 1 | 4 |   |
| E. aerogenes      |    |    | 1 | 3 | 1 |
| E. cloacae        |    |    | 1 | 8 | 11|
| E. coli           |    |    | 4 | 14 | 3 |
| K. oxytoca        |    |    | 4 | 12 | 9 |
| K. pneumoniae     |    |    | 1 | 11 | 9 |
| M. morganii       |    |    | 1 | 2  | 2 |
| M. pyrallis       |    |    | 4 | 13 | 2 |
| P. vulgaris       |    |    | 3 | 12 |   |
| P. rettgeri       |    |    | 1 | 1 | 1 |
| S. marcescens     |    |    | 4 | 1 |   |

Conclusion. This initial evaluation of the plazomicin MTS showed good correlation to BMD MIC. Further testing with additional isolates and media at multiple test sites is warranted.

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2061. Impact of a Penicillin-Binding Protein 2a Rapid Diagnostic Test on Patients Who Present With Staphylococcus aureus Orthopedic Hardware Infections
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