150. Urinary Tract-Associated Gram-Negative Bacteria: Impact of Treatment Duration
Jasmín K. Badwal, PharmD; Elizabeth O. Hand, PharmD, BCPS, BCIDP; John M. Lyons, PharmD, BCPS and Kristi A. Traugott, PharmD, BCPS, BCIDP; University Health System, San Antonio, Texas

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Background. Gram-negative bloodstream infections are one of the leading causes of death in the United States. A select number of studies have been conducted evaluating various treatment durations; however, none have specifically focused on urinary sources. The purpose of this study was to compare the effect of short vs. long course of antimicrobial therapy on clinical and microbiological outcomes for urinary tract-associated gram-negative bacteria (GNB).

Methods. This was a single-center, retrospective review from January 2016 to October 2018. Subjects were screened using a report of all positive GNB cultures. Hospitalized patients ≥18 years of age were included if they had a bacteremia from a urinary source and received an intravenous or a highly bioavailable oral agent for ≥7 days. Patients were excluded due to pregnancy, incarceration, inappropriate definitive therapy, polymicrobial bacteremia, unaddressed source control issues, or death during the treatment course. Short course (SC) was defined as ≥7 to 10 days, while long course (LC) was defined as ≥10 days. The primary composite outcome of treatment failure included both 30-day all-cause mortality and 90-day secondary recurrence. Secondary composite outcomes included 30-day re-admission, 90-day mortality, resistance development, and C. difficile infection.

Results. A total of 207 patients were included: 45 patients received SC and 162 received LC. Both groups were similar at baseline in terms of comorbidities, intensive care unit (ICU) admission, and vasopressor initiation. No statistically significant difference in the primary composite endpoint was observed: 2/45 (4.4%) SC vs. LC 10/162 (6.2%), P = 0.66. There was also no difference in other secondary outcomes.

Conclusion. Consistent with prior studies, we were unable to find a significant difference in clinical failure rates between SC vs. LC for treatment of urinary tract-associated GNB. Generalizability to more complicated cases including those with inadequate source control may be limited; however, these data add to the body of literature supporting the use of shorter antibiotic durations.

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151. Comparing the Clinical Utility of Rapid Diagnostic Tests for Gram-Negative Bloodstream Infection Using a Desirability of Outcomes Ranking
Kimberly C. Claes, PharmD1; Kathryn Schlaffer, MD2; Zegheb Kapadich, PhD2; Yvonne Jiang, PhD2; Scott R. Evans, PhD3; J. Kristie Johnson, PhD, D(ABMM)4 and Surbhi Leekha, MBS, MPH5; School of Pharmacy; University of Maryland, Baltimore, Maryland; 3Mercy Medical Center, Baltimore, Maryland; 4University of Maryland Medical Center, Baltimore, Maryland; 5Department of Pathology, University of Maryland, Baltimore, Maryland.

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Background. Rapid diagnostic testing (RDT) technology in bloodstream infections (BSI) has outpaced provider understanding of how to effectively use it. To optimize the use of RDT platforms and antibiotic therapy, decision makers must determine which RDTs to implement at their institutions. A thorough understanding of which platform to choose extends beyond simple analytic measures of sensitivities and specificities. We examined how test results related to common clinical decision points.

Methods. Retrospective study of adult patients with Gram-negative (GN) BSI from the University of Maryland Medical Center. The clinical microbiology laboratory used Verigene BC-GN in clinical practice. Discarded blood samples were run on BioFire FilmArray BCID. Final organism identification/susceptibility, antibiotic exposures, and clinical outcomes were reviewed. DOOR was applied to theoretical therapy decisions based on both actual prescribing adherence to institutional algorithm recommendations; 1 being most and 6 being least desirable (Table 1). A partial credit scoring system was applied to DOOR from most (100) to least desirable (0) outcome. Comparisons were made in a paired manner.

Results. 77 patients met inclusion. The median age was 58 (IQR 47, 68), 44.2% were in the ICU, and 75.3% had ID consult within 24 hours of BSI. Organism identification included: E. coli (35.1%), K. pneumoniae (23.4%), P. mirabilis (10.4%), S. marcescens (10.4%), Enterobacter spp. (9.4%), P. aeruginosa (3.9%). The only resistance determinant was CTX-M (11.6%) in antibiotic change occurred in 26.2% of cases, divided between escalation and de-escalation. Based on the actual utilization of RDT results, median DOOR was not different between BC-GN and BCID (3 [IQR 3.4] vs. 4 [IQR 3.4], P = 0.44). Using a partial credit scoring system, the mean score was not different between platforms (49.8 ± 26.8 vs. 47.7 ± 20.3, P = 0.32). Through pairwise comparisons, BC-GN would have resulted in an optimal outcome of 15.3% (95% CI 4.7% to 19.3%) more often than BCID.

Conclusion. Based on the actual use of RDTs for GN BSI there was no difference in potential clinical outcomes between platforms in this relatively small sample. DOOR is a novel mechanism to quantitate clinical utility and compare RDTs.

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152. Brevibacterium species: Case Series and Literature Review of an Emerging Opportunistic Cause of Bloodstream Infections
FNU Shweta, MBBS; Pooja Gurram, MBBS; Sarwat Khalil, MBBS; Kyle Rodino, PhD and John C. O’Horo, Sr., MD, MPH; Mayo Clinic, Rochester, Minnesota

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Background. Brevibacterium species are non-motile, catalase-positive, obligate aerobic gram-positive bacilli. Colonies are yellow to white-gray, non-hemolytic, smooth, 6-55% sodium chloride tolerant. B. fermentum post neurosurgical meningitis was first described in 1969 in an infant. B. casei remains the most commonly isolated species (Table 4). The most commonly reported syndromes are bloodstream infections (BSIs) and endocarditis. Despite these reports, this organism continues to be listed on CDC’s NCBI commensal database.

Methods. Isolates of Brevibacterium from clinical samples at Mayo Clinic, Rochester from January 1, 2014 to December 31, 2018 were identified. Charts were reviewed to determine patient demographics, immune status, source of culture, comorbidities, antibiotic susceptibility test (AST), length of stay (LOS) in hospital and intensive care unit (ICU), and mortality. Likelihood ratio (L-R) and Pearson correlation coefficient (PCC) of nominal data were calculated using the Chi-square test and Fischer exact test (FE). We defined statistical significance as P ≤ 0.05.

Results. We identified 48 isolates from 45 unique patients. 46% were females. Distribution of age, hospital and ICU LOS, and time to culture growth, and AST data are shown in Table 1. 15.5% patients received allogeneic or autologous stem cell (SCT), or solid-organ transplant (SOT) recipients. 89% cultures were from sterile sources and 64.75% were blood cultures. Of these, 63.64% were monomicrobial. 62% of isolates identified to species level were B. casei. 5 patients were treated; an additional 10 received active antibiotics for other indications. Statistically significant variables are reported in Tables 2 and 3. Thirty-day mortality was 13%. This was higher in patients with bacteremia (L-R: 5 [P = 0.02]) but FE was not statistically significant (P = 0.15).

Conclusion. Accurate diagnosis of Brevibacterium may require molecular techniques. At our center, SCT or SOT recipient status and recent chemotherapy were associated with bacteremia. In these patients, this organism could represent an opportunistic cause of BSI. AST data suggest that Vancomycin offers a reasonable empiric treatment option. Additional data are needed to further define host populations in whom this organism presents pathogenicity.

Table 1: Secondary Variables and Antimicrobial Susceptibility Test Results

| Parameter | Unit | Median | Interquartile Range |
|-----------|------|--------|---------------------|
| Age       | Years | 59     | 51 – 72             |
| Hospital Length of Stay (LOS) | Days | 6      | 4 – 17              |
| Intensive Care Unit LOS | Days | 1      | 0 – 2.5             |
| Time to Growth | Hours | 57     | 46.25 – 65.5        |

| Antibiotic | Susceptible (%) | Intermediate (%) | Resistant (%) |
|------------|-----------------|-----------------|--------------|
| Vancomycin | 27/48 (56)      | 0               | 0            |
| Penicillin | 27/28.5 (97)    | 4/57 (15)       | 1/14 (3)     |
| Ceftriaxone| 27/28.5 (97)    | 2/28.5 (7)      | 1/43 (2)     |
| Meropenem  | 6/18 (33)       | 1/14 (3)        | 0            |

Methicillin susceptibility test was performed only on 7/48 (18%) isolates. Minimum inhibitory concentration calculated and interpreted according to current CLSI breakpoints.

Table 2: Likelihood of Bacteremia by Transplant Status

| Count Total | % Col % Row | Other Source of Positive Culture | Blood Culture | Total |
|-------------|-------------|---------------------------------|---------------|-------|
| No Transplant | 15          | 33.33                           | 51.11         | 38    |
| Transplant   | 100.00      | 73.33                           | 76.87         | 84.44 |
| Total        | 15          | 33.33                           | 51.11         | 38    |

Test Likelihood Ratio | Chi Square | P-value |
|---------------------|------------|---------|
| Vancomycin          | 6.304      | 0.0120  |
| Pearlson            | 4.145      | 0.0418  |
Table 3: Likelihood of Bacteremia by Recent Chemotherapy

| Test | Chi Square | Pearson |
|------|------------|---------|
| Likelihood Ratio | 8.384 | 0.0038* |
| Pearson | 5.625 | 0.0177* |

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153. A Review of Ten Cases of Pulmonic Valve Infective Endocarditis
Harry E. Hicklin, MD; Glen Huang, DO; Kyle A. Davis, PharmD; Erin W. Barnes, MD and James E. Peacock, Jr., MD; Wake Forest Baptist Medical Center, Winston-Salem, North Carolina
Session: 37. Bacteremia, CLABSI, and Endovascular Infections
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Background. Pulmonic valve (PV) infective endocarditis (IE) is a rare entity, accounting for ~1.5–2% of all cases of IE. As a result, published literature describing the diagnosis and management of patients with PVIE is limited.

Methods. A retrospective review of patients ≥18 years old admitted to Wake Forest Baptist Medical Center from 2012 to 2017 with a diagnosis of PVIE based on the modified Duke criteria was performed.

Results. Ten patients were identified as having PVIE, 9 of whom had isolated PV involvement and 1 of whom had concurrent aortic valve involvement. The diagnosis of IE was definite per the modified Duke criteria in 8 patients. The median age was 41 years and 30% were female. Two patients had pacemakers, 1 had a prosthetic PV, and 1 had congenital heart disease. Six patients were identified as persons who inject drugs (PWID). On admission, 5 patients manifested fever and 5 had a documented murmur. Seven patients had septic pulmonary emboli with 4 of 7 patients manifesting pulmonary hypertension. Transthoracic echocardiography (TTE) revealed vegetations in 4 of 10 patients whereas PV vegetations were demonstrated in all 8 patients undergoing transesophageal echocardiography (TEE). S. aureus was the most common causative organism, accounting for 5 of the cases of PVIE with four of the five isolates being methicillin-resistant. Bacteremia persisted for a median of 3 days. One patient with prosthetic valve replacement. The planned median duration of antimicrobial therapy was 6 weeks. The median length of stay was 18 days. Three patients died during the index hospitalization, 1 of whom was a PWID. No episodes of repeat PVIE occurred within 1 year.

Conclusion. PVIE is a rare disease. Only 40% of our patients had vegetations on TTE in contrast to a reported diagnostic yield of >90% in the literature. As such, PVIE may be underdiagnosed. S. aureus was the most common organism isolated, which is in keeping with prior reports. PWID appear to be at high risk for PVIE. In view of the worsening opioid epidemic, more research on PVIE is warranted.

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154. Do I Really Need a Transesophageal Echo? Comparing Echocardiographic Modalities in Native Valve Infective Endocarditis due to Methicillin-Resistant Staphylococcus aureus
James Livesey, DO; William Lorson, DO; R. Eric Heidel, PhD and Mahmoud Sherman, MD; Graduate School of Medicine, University of Tennessee, Knoxville, Tennessee; University of Tennessee, Knoxville, Tennessee
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Background. Methicillin-resistant Staphylococcus aureus (MRSA) infective endocarditis (IE) is associated with high morbidity and mortality. Management commonly includes six-weeks of antibiotics and surgical intervention, if the patient has complications. Current guidelines recommend obtaining an echocardiogram. Transesophageal echocardiogram (TEE) is preferred over transthoracic echocardiogram (TTE). We wanted to evaluate the role of a TEE in changing management of MRSA IE.

Methods. A retrospective cohort of patients with MRSA IE was analyzed between January 2013 and July 2017 at a tertiary care facility in East Tennessee. Patients with prosthetic valves or cardiac devices were excluded. Demographic, echocardiographic, antibiotic, blood culture, mortality, and intravenous drug use data were collected (Figure 1).

Results. Seventy-eight patients met the inclusion criteria. TEE was performed on 73 patients while five patients proceeded directly to TEE. Of the 73 patients that had a TTE, 33 (45.2%) detected the presence of vegetation and 40 (54.8%) did not. Of the 33 patients with a positive TTE, 15 subsequently underwent TEE, confirming IE. Out of the 40 patients with a negative TTE, 34 underwent TEE, of which 22 (64.7%) showed a vegetation. (Figure 2). A total of ten patients (12.8%) from the study underwent surgery. Of these ten, three (30%) had a positive TTE only, with no subsequent TEE. Five (50%) had both a positive TTE and TEE, and two (20%) had a negative TTE but positive TEE.

Conclusion. Transthoracic echocardiogram was adequate to visualize vegetations in 45.2% of patients. Completing a TEE increased the sensitivity of visualizing a vegetation, but management was most often not altered. Only two patients (5%) with a negative TTE, but positive TEE proceeded to surgery because of the findings. This causes us to question whether a subsequent TEE need be pursued when a TTE is negative in the setting of definite or possible IE by the modified Duke criteria. Even if a vegetation is seen on TEE the patient would most likely receive the same treatment, 6 weeks of intravenous antibiotics, as if no vegetation was seen. Forgoing a TEE reduces risk to the patient of undergoing a procedure, and reduces costs to the healthcare system.

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155. A Case Series of Patients with Gemella Endocarditis
Abarna Ramanathan, MBChB; Steven M. Gordon, DO; R. Eric Heidel, PhD; William Lorson, DO; Nabin K. Shrestha, MD; Cleveland Clinic, Cleveland Heights, Ohio; Cleveland Clinic Foundation, Cleveland, Ohio
Session: 37. Bacteremia, CLABSI, and Endovascular Infections
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Background. Gemella is a rare cause of native valve endocarditis. Prior case series have described four patients with Gemella endocarditis, all of whom received a transesophageal echocardiogram (TEE) after a positive transthoracic echocardiogram (TTE) for infective endocarditis (IE) was performed. We wanted to evaluate the necessity of performing a TEE after a positive TTE for IE.

Methods. A retrospective review of patients with Gemella endocarditis was performed. All medical records were reviewed for patient demographics, clinical presentation, echocardiographic results, and outcomes.

Results. A total of four patients with Gemella endocarditis were identified. All patients were diagnosed with IE after a positive TTE. Three patients subsequently underwent a TEE, of which two (67%) showed a vegetation. The fourth patient underwent surgery due to severe valvular regurgitation. All patients were successfully treated with intravenous antibiotics and no patients died.

Conclusion. Gemella endocarditis is a rare cause of native valve endocarditis. Prior case series have described four patients with Gemella endocarditis, all of whom received a TEE after a positive TTE for IE was performed. We found that a TEE is not necessary in all cases of Gemella endocarditis. Future studies are needed to determine the role of TEE in the diagnosis and management of Gemella endocarditis.

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