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1037. Effect of Oral Step-Down Therapy on Readmission Rates in Escherichia coli Bacteremia
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Background. Escherichia coli is the most common cause of community-acquired bloodstream infections. Fluoroquinolones (FQ) and trimethoprim/sulfamethoxazole (TS) are preferred for oral step-down therapy due to high bioavailability. Antimicrobial stewardship programs commonly restrict FQ use, promoting consideration of non-FQ agents for treatment of sensitive organisms. We hypothesized that oral β-lactams would be non-inferior to FQ and TS with a primary analysis of 30-day all-cause readmission.

Methods. This was a retrospective non-inferiority study that reviewed electronic health records for patients with E. coli bacteremia from January 1, 2016 to December 31, 2017. Exclusion criteria included hospital acquired infections, death during hospitalization and severe infection. Patients demographics, Pitt Bacteremia Score, Charleston Comorbidity Index, antibiotic regimen (FQ/TS), and readmission were collected. Patients were divided into two groups, oral FQ/TS versus β-lactams. A pretrial noninferiority margin for the primary outcome was set at 3%. Secondary outcomes included all-cause infection and E. coli readmission.

Results. Demographics were similar between groups. 57 patients received FQ/TS and 151 received β-lactams. The 30-day all-cause readmission rate was 15.8% and 29.1%, respectively (absolute risk difference 13.3%; CI: 1–25). β-lactams were found to be inferior to FQ/TS for 30-day all-cause readmission. In-hospital mortality occurred in 5.3% of patients in the FQ/TS group versus 14.6% of patients in the β-lactam group (P = 0.008). The in-hospital mortality benefit associated with SBCs varied with GNB species, including Stenotrophomonas maltophilia (30/128 [23%] vs. 14/31 [45%]; P = 0.02) and Escherichia (33/377 [9%] vs. 37/215 [17%]; P = 0.003). In-hospital mortality in those with SAB was also lower when SBCs were drawn (143/1003 [14%] vs. 46/144 [32%]; P = 0.0011) (figure). In NGB, positive SBCs, relative to negative SBCs, was associated with increased in-hospital mortality (44/217 [20%] vs. 133/956 [14%]; P = 0.02). Persistent bacteremia occurred in 49% (449/1003) of SAB patients and 28% (217/1097) of GNB patients with SBCs. Persistent bacteremia risk differed by GNB species (P = 0.004), and was highest among those with Stenotrophomonas maltophilia (9/19 [47%]) or Serratia (24/76 [31%]).

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1038. Edwardsiella tarda Bacteremia: Epidemiology, Clinical Features, and Outcomes
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Background. Edwardsiella tarda is primarily associated with gastrointestinal disease, but an increasing number of cases with extraintestinal disease have been reported. Additionally, E. tarda bacteremia (ETB) may be associated with high mortality; however, little is known about its clinical epidemiology.

Methods. We collected all clinical information of ETB patients identified between January 2005 and December 2016 from their electronic medical records. We described the epidemiology, clinical features, and 30- and 90-day mortality of these patients.

Results. A total of 182,668 sets of blood cultures were obtained during the study period. 0.02% (26 patients) had E. tarda positive. Twenty-six patients (13 men and 13 women) with a median age of 75 years were diagnosed with ETB. Clinical diagnoses by infection site included cholangitis (n = 9), liver abscess (n = 6), enterocolitis (n = 4), cholecystitis (n = 3), and spontaneous bacterial peritonitis, mycotic aneurysm, necrotizing fasciitis, empyema, osteomyelitis, and secondary peritonitis (n = 1 each). The overall 30-day and 90-day mortality rates of ETB in our cohort was 11.5% (3/26) and 26.9% (7/26), respectively. There was no seasonal variation in the incidence of E. tarda infection. All E. tarda strains isolated from blood cultures were susceptible to all tested antibiotics. Additionally, hepaticoectomy infection was more frequently seen in ETB compared with non-bacteremic E. tarda infections.

Conclusion. E. tarda is the largest case series on ETB to date. We found that ETB is a rare entity that is not associated with high mortality. Hepaticoectomy infection is the most common clinical manifestation.

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1039. Surveillance Blood Cultures Associated With Decreased Mortality in Gram-Negative Bacteremia
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Background. Prior studies have suggested that surveillance blood cultures (SBCs) may not be indicated in the setting of Gram-negative bacteremia (GNB). However, it is unclear how particular microbial species influence the need for SBCs in GNB.

Methods. We conducted a prospective cohort study of inpatients at Duke with Staphylococcus aureus bacteremia (SAB) and GNB from 2002-2015. Patients who died <24 hours from the first positive blood culture were excluded. Patients provided written informed consent. SBCs were defined as a blood culture drawn from 24 hours to 7 days from initial positive blood culture. Persistent bacteremia was defined as a positive SBC with the same organism. Statistical testing included Fishers exact and chi-square tests.

Results. There were 2856 episodes of bacteremia over the study period (SAB: 1,147 [40%]; GNB: 1,709 [60%]). SBCs were drawn in 87% (1,003/1,147) of SAB patients and 64% (1,097/1,709) of GNB patients. SBC rates varied by GNB species (P < 0.001), being more commonly drawn for those patients with Pseudomonas bacteremia (128/159 [80%] vs. those with Escherichia bacteremia (377/592 [62%]). In GNB, acquisition of SBCs, regardless of positivity, was associated with decreased in-hospital mortality (1771/1735 [15%] vs. 106/536 [20%]; P = 0.008). The in-hospital mortality benefit associated with SBCs varied with GNB species, including Pseudomonas (30/128 [23%] vs. 14/31 [45%]; P = 0.02) and Escherichia (33/377 [9%] vs. 37/215 [17%]; P = 0.003). In-hospital mortality in those with SAB was also lower when SBCs were drawn (143/1003 [14%] vs. 46/144 [32%]; P = 0.0011) (figure). In GNB, positive SBCs, relative to negative SBCs, was associated with increased in-hospital mortality (44/217 [20%] vs. 133/956 [14%]; P = 0.02). Persistent bacteremia occurred in 49% (449/1003) of SAB patients and 28% (217/1097) of GNB patients with SBCs. Persistent bacteremia risk differed by GNB species (P = 0.004), and was highest among those with Stenotrophomonas maltophilia (9/19 [47%]) or Serratia (24/76 [31%]).

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1040. Comparative Characteristics of Patients With Pseudomonas Bacteremia Receiving Intravenous Only vs. Intravenous Followed by Oral Therapy

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Background. There have been few studies on treatment approaches to Pseudomonas bacteremia and transition from intravenous (IV) to oral (PO) therapy. The objective of this study was to determine whether IV to PO switch therapy was associated with worse 30-day mortality than IV only therapy for patients with Pseudomonas bacteremia.

Methods. This was a retrospective cohort study comparing patients with ciprofloxacin-susceptible Pseudomonas bacteremia treated with IV only to those that transitioned from IV to PO switch therapy. We evaluated 153 consecutive patients from January 2008 to December 2017; of those, 119 (78%) had ciprofloxacin-susceptible Pseudomonas. We excluded 68 patients due to polymicrobial bacteremia, <3 days, or >21 days of therapy. This left 54 patients for evaluation, 29 of whom received IV only, and 25 with IV to PO switch therapy.

Results. Median patient age was 66 years for both groups. IV only therapy was associated with Hispanic ethnicity (48% vs. 28%, P = 0.027), hospital acquired infection (52% vs. 13%, P = 0.0035), Pitt bacteremia score (median [interquartile range] of 3 [2-3] vs. 1 [0-2], P = 0.0007), duration of IV therapy (median [interquartile range] of 11 [7-14] vs. 4 [2-6], P < 0.0001), and 30-day mortality (31% vs. 0%, P = 0.0023). The IV only group was more likely to have an associated diagnosis of pneumonia (44% vs. 16%, P = 0.0264) and less likely to have an associated diagnosis of urinary tract infection (17% vs. 60%, P = 0.0021). In a multivariate analysis, with IV only vs. IV to PO switch therapy as the independent variable, mortality as the dependent variable, and pneumonia and UTI as covariates, IV only was associated with mortality (P = 0.0066).

Conclusion. Patients on IV only therapy were more likely to die at 30 days than those on IV to PO switch therapy, when accounting for differences in diagnosis of pneumonia and UTI, suggesting clinician recognition of increased severity of illness in the IV only group.

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1041. How Do Healthcare Providers Approach Empiric β-Lactam (BL) Treatment of Bloodstream Infections (BSI) Caused by Gram-Negative Rods (GNRs)?

Analysis of Escherichia coli and Klebsiella pneumoniae BSI From the Veterans Health Administration (VHA)

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Background. Physicians make decisions regarding antimicrobial chemotherapy based on clinical and demographic factors, choosing initial empiric therapy without knowing the pathogen or its susceptibilities. Given the various treatment options and antibiotic susceptibility testing (AST) results, we defined “initial” empiric treatment as agents received after GS but before AST results. Patient characteristics, treatment, and outcomes were summarized overall and by organism.

Results. Of 36,531 BSI identified, we analyzed a subset of 21,597 that met our inclusion criteria (figure). Within this subset of patients, the mean age was 78.3 and all-cause 30-day mortality was 13.9% (2,054 out of 14,735) for E. coli and 17.8% (1,220 out of 6,862) for K. pneumoniae. Initial empiric treatment included an effective agent in 90.4% (91.2% in E. coli, 88.7% in K. pneumoniae) of cases. This rate increased to 95.3% (96.0% in E. coli, 93.8% in K. pneumoniae) for modified empiric treatment. The most commonly prescribed initial empiric BL was piperacillin/tazobactam, observed in 55% of treated patients, followed by ceftriaxone and cefepime in 14% and 11% of treated patients, respectively. Carbapenems were included in 8% of initial and 13% of modified empiric treatments.

Conclusion. In this cohort of older patients with E. coli and K. pneumoniae BSI, higher rates of effective BL empiric treatment were achieved after GS results. BL empiric regimens consisted mostly of broad-spectrum agents. These observations highlight the potential utility of a diagnostic tool available shortly after specimen collection to inform treatment and improve patient outcomes.

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1042. Stenotrophomonas maltophilia Bacteremia, A 10-Year Tertiary Center Experience

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Background. Stenotrophomonas maltophilia is a hospital acquired infection that is associated with high morbidity and mortality. There has been a reported rise in S. maltophilia infections, presumed secondary to the increase in the population at risk.

Methods. We retrospectively reviewed all hospitalized patients with S. maltophilia bacteremia from January 2008 through January 2018. We analyzed patient population and described patients at risk, sources of infection, and changes in antimicrobial susceptibility profile.

Results. A total of 94 patients were analyzed, including 52 males, median age of 56 (46-65.75 IQR). The population included 60 infections in those with malignancies and 30 infections in transplant recipients. At presentation, 58 (61.7%) were febrile, while 54 (58.1%) presented with hemodynamic instability. Majority (70.2%) received broad-spectrum antimicrobials within 2 weeks of presentation. The most common source was catheter associated infection (n = 60), 15 cases were secondary to gastro-intestinal, and 9 due to a pulmonary source. Almost half, 46 (48.9%) required ICU admission. Two patients were diagnosed with endocarditis. Most isolates, 61 (64.9%), were resistant to ceftazidime, 8 (8.5%) resistant to TMP/SMX and 20 (21.5%) were resistant to levofloxacin. Exposure to a quinolone in the 30 days prior to presentation did not impact fluoroquinolone resistance. Five patients were exposed to Trimethoprim/Sulfamethoxazole (TMP/SMX) in the 30 days prior to presentation, which was associated with higher rate of TMP/SMX resistance compared with those without exposure (80% vs. 98.8%, P = 0.004). Treatment options commonly included combination therapy, and TMP/SMX was a primary agent used in the majority, 59 (62.8%). All-cause in-hospital mortality was 26.6%. All-cause mortality was lower for line associated infections (16.67%) vs. other sources (44.12%) with P = 0.0038.

Conclusion. S. maltophilia bacteremia should be considered in hospitalized patients with recent use of broad-spectrum antibiotics. Although TMP/SMX continues to have reliable activity, use of empiric ceftazidime pending susceptibility testing should be avoided as trend toward increasing resistance is noted. We noted a drop in TMP/SMX susceptibility in those with recent reported TMP/SMX use.

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