Session: 37. Bacteremia, CLABSI, and Endovascular Infections
Thursday, October 3, 2019: 12:15 PM

**Background.** Left ventricular assist device (LVAD) implantation has become an effective treatment option for patients with severe heart failure. However, infections remain a substantial risk. Therefore, the aim of this study was to gain insight in the incidence and outcomes of LVAD infections at our center and develop an up-to-date flowchart for the management of LVAD-related infections.

**Methods.** A retrospective study was performed which included all patients with an LVAD implanted between 2006 until 2019, along with a rigorous review of the current literature. Clinical records and microbiological laboratory results of all patients were reviewed. In view of local infectious complications, a flowchart was developed for the contemporary management of LVAD-related infections (Figure 1).

**Results.** Overall, 106 patients (median age 54 years [IQR 47–60], 78% male) were included, of whom 92 (87%) as bridge-to-transplantation and 14 (13%) as destination therapy. LVAD-related infections occurred in 30 (28%) of the patients. The median time until first infection was 308 days [IQR 115–528], and the median duration of hospital stay was 16 days [IQR 4–29]. Eighty percent of LVAD-related infections were driveline-related. The most common causative pathogen was Staphylococcus aureus, which was present in almost half of the cases (40%). Patients who experienced infections were younger [46 [IQR 37–57] vs. 56 [IQR 52–62]; P < 0.001]. The survival rate at 3 years was 76% in the infected vs. 94% not infected patients; P = 0.037. A secondary infection occurred in 10 patients (33%). At 3 years of follow-up, 31 patients were successfully transplanted. Six patients with deep S. aureus driveline infections were treated according to the standardized protocol of whom 2 with suppressive therapy by cephalexin, with clinical success so far.

**Conclusion.** LVAD infections occur frequently and lead to prolonged periods of hospital admissions and death. The lack of standardized treatment regimens complicates the treatment of LVAD-related infections. A comprehensive flowchart to treat future LVAD-related infections in a protocolized fashion was developed, based on our single-center experience. While the preliminary results look promising, more follow-up of the treated patients is needed.

**Disclosures.** All authors: No reported disclosures.

---

**128. Adequacy of Commonly Prescribed Antimicrobials for Empiric Coverage of Gram-Negative Bacterial Pathogens Recovered from the Bloodstream of Patients Attending Emergency Rooms in Canada: Analysis of Data from the CANWARD Program**

Background. Inadequate empiric antimicrobial therapy for Gram-negative bac- teremia is associated with adverse clinical outcomes. The purpose of this study was to evaluate the proportion of Gram-negative bacterial isolates recovered from the bloodstream of patients attending Canadian emergency rooms (ERs) that remain susceptible to commonly prescribed antimicrobials.

Methods. Annually from 2007 to 2018, sentinel hospitals across Canada collected bloodstream isolates from patients attending ERs as part of the CANWARD study. Susceptibility testing was performed using broth microdilution as described by CLSI (data analysis limited to Gram-negative bacteria in the top 10 pathogens), with current CLSI breakpoints applied. Extended-spectrum β-lactamase (ESBL)-producing isolates were confirmed using the CLSI disk diffusion method.

Results. Gram-negative bacteria among the top 10 bloodstream pathogens for patients seen at ERs across Canada were: *Escherichia coli* (n = 2,414), *Klebsiella pneumoniae* (n = 573), *Pseudomonas aeruginosa* (n = 211), *Proteus mirabilis* (n = 119), and *Enterobacter cloacae* (n = 114). Aggregate susceptibility of these isolates to common antimicrobials was as follows (% susceptible [S]): meropenem 99.4% S, piperacillin–tazobactam 98.5% S, gentamicin 93.3% S, ceftriaxone 88.1% S, ciprofloxacin 81.4% S, TMP-SMX 73.5% S. The most active antimicrobials evaluated vs. *E. coli* were meropenem (100% S), piperacillin–tazobactam (98.8% S), and ceftriaxone (93.3% S). Ceftriaxone susceptibility among *E. coli* isolates declined from 95.4% in 2007 to 89.8% in 2018. The average proportion of *E. coli* isolates that harbored an ESBL enzyme increased from 3.4% in the first three study years to 8.4% in the last three years. The most active antimicrobials evaluated vs. *P. aeruginosa* isolates were meropenem (99.7% S), piperacillin–tazobactam (98.8% S), gentamicin (97.7% S), and ceftriaxone (96.9% S).

Conclusion. The most consistently active antimicrobials for empiric treatment of patients at Canadian ERs with Gram-negative bacteremia are meropenem and piperacillin–tazobactam. Ceftriaxone susceptibility among *E. coli* has declined over the last 12 years, mostly related to an increase in ESBL-producing isolates.

Disclosures. All authors: No reported disclosures.

---

**129. Antimicrobial Activity of Ceftazidime–avibactam and Comparator Agents Tested against Gram-Negative Organisms Isolated from Patients with Bacterial Bloodstream Infections in United States Medical Centers (2017–2018)**

Cecilia G. Carvalhaes, MD, PhD; Mariana Castanheira, PhD; Rodrigo E. Mendes, PhD and Helio S. Sader, MD, PhD; JMI Laboratories, Inc., North Liberty, Iowa

Session: 37. Bacteremia, CLABSI, and Endovascular Infections
Thursday, October 3, 2019: 12:15 PM

**Background.** We evaluated the antimicrobial susceptibility of *Enterobacteriaceae* (ENT) and *P. aeruginosa* (PSA) causing bloodstream infections (BSI) in the United States (US) hospitals.

**Methods.** A total of 3,317 ENT and 331 PSA isolates were consecutively collected in 1 patient) from patients with BSI in 68 US medical centers in 2017–2018 and tested for susceptibility (S) by reference broth microdilution methods in a central laboratory as part of the International Network for Optimal Resistance Monitoring (INFORM) Program. β-Lactamase screening was performed by whole-genome sequencing on Enterobacteriaceae (ENT), *P. aeruginosa* (PSA) causing bloodstream infections. ENT with decreased S to broad-spectrum cephalosporins (ESBL phenotype).

**Results.** The most common ENT species isolated from BSI were *E. coli* (41.9%), *K. pneumoniae* (29.1%), and *E. cloacae* (14.9%). The most active agents against ENT were cefazidime–avibactam (CAZ-AVI; 99.6% S), amikacin (AMK; 99.6% S) and meropenem (MEM; 99.3% S). CAZ-AVI was active against ESBL mutants of *E. coli* (94.0% S), *E. cloacae* (87.2%), and the most active agents against ENT were cefazidime–avibactam (CAZ-AVI; 99.9%), amikacin (AMK; 99.6% S) and meropenem (MEM; 99.3%). CAZ-AVI was active against all ENT and KPN isolates (100% S). Only 2 ENT isolates (0.06%) were CAZ-AVI resistant. 2 NDM-1-producing ECL isolated in the New York City area. Ceftolozane–tazobactam (C-T) and piperacillin–tazobactam (PI-PAZ) showed good activity against ENT and KPN isolates. With limited activity against CBT (81.9–83.7%). The most common ENTs were CTX-M-type, which was observed in 93% of ESBL producers (mainly CTX-M-15 [64% of ESBL producers] and CTX-M-27 [13%]), and OXA-1/OXA-30 (42%); 42% of ESBL producers (*n* = 333, excluding carbapenemase producers) displayed ≥2 ESBL genes, mainly CTX-M-15 and OXA-1/OXA-30 (40% of ESBL producers). The most active agents against PSA producers were CAZ-AVI (100.0%), imipenem (99.4%), and colistin (COI, 99.1%). Only CAZ-AVI (99.4%), AMK (96.2%) and MEM (92.8%) were active against >90% of multidrug-resistant (MDR) ENT. Among 19 carbapenem-resistant ENT (CRE, 0.6% of ENT), 9 produced a KPC-like, 2 an NDM-1, and 2 an NDM-4. Carbapenemase genes were not found in 6 CRE isolates. COL (100.0%), CAZ-AVI (98.5%), AMK (98.5%), CT (98.1%), and tobramycin (97.0%) were very active against PSA.
Conclusion. CAZ-AVI exhibited potent in vitro activity and great spectrum against ENT (99.9%) and PSA (98.5%) isolated from patients with BSI from US hospitals.

Disclosures. All authors: No reported disclosures.

130. Clinical Presentation and Molecular Epidemiology Characterization of Invasive GBS Infection in Nara, Japan from 2007 to 2016

Nobuyuki Hirai, 4th Year Degree1; Kei Kasahara, PhD1; Yoshiko Ogawa, 5th Year Degree1; Yuki Suzuki, 4th Year Degree1; Naokuni Hishiya, 4th Year Degree1; Ryuichi Nakano, PhD1; Hisakazu Yano, MD, PhD1; Masahide Yoshikawa, PhD2 and Keiichi Mikasa, MD, PhD3; 1Nara Medical University, Kashihara City, Nara, Japan

Session: 37. Bacteremia, CLABSI, and Endovascular Infections

Thursday, October 3, 2019: 12:15 PM

Background. Streptococcus agalactiae (GBS), a leading cause of neonatal infections, also occurs as an invasive infection in elderly people. The aim of this study was to evaluate the clinical aspect of invasive infections and the phenotypic and genetic diversity of GBS isolates to develop better antibiotics treatment and curb the increasing rate of antibiotic resistance in Nara, Japan.

Methods. GBS strains sequentially collected from blood and cerebrospinal fluid cultures between 2007 and 2016 were identified and evaluated for capsular types, multilocus sequence typing (MLST), antibiotic susceptibility, resistant gene, and pulsed-field gel electrophoresis (PFGE). Clinical characteristics were retrospectively collected.

Results. A total of 42 GBS isolates (12 from children and 30 from adults) were collected. In adults, common underlying conditions were malignancy and diabetes, and primary bacteremia was the most common source of infection. In children, 6 were early-onset diseases, 4 were late-onset diseases, and 2 were school children. Overall, the mortality rate was 0% in children and 17% in adults. The serotypes and main clonal complex are summarized in Table 1. Minimum inhibitory concentrations of the antibiotics affects bacterial flora and induces selectivity of specific clones, thereby curbing the increasing rate of antibiotic resistance in Nara, Japan.

Conclusion. In clinical aspects, neonates with early-onset diseases experienced certain disorders during the perinatal period. In adults, serotype Ib, which tends to exhibit levofloxacin resistance, was the most common, followed by serotypes V and VI belonging to ST1, and serotype III belonging to ST335, which tends to exhibit macrolide resistance, was the most common, followed by serotypes V and VI belonging to ST1; however, they were not observed in children. Contrastingly, serotype II belonging to ST335 were highly identical.

Table 1

| Serotype | Infants | Adults | Total |
|----------|---------|--------|-------|
| Complex  | 10      | 19     | 29    |
| IA       | 4       | 2      | 6     |
| IB       | 2       | 6      | 8     |
| II       | 1       | 1      | 2     |
| III      | 5       | 3      | 8     |
| IV       | 1       | 1      | 2     |
| VI       | 5       | 5      | 10    |
| VIII     | 1       | 1      | 2     |
| Total(*)| 2(5)    | 5(12)  | 7(17) |

Table 2

| MIC of the 42 GBS isolates |
|----------------------------|
| MIC (µg/mL) | ≤0.06 | 0.125 | 0.25 | 0.5 | 1 | 2 | 4 | 8 | 16 | 32 |
| penicillin       | 42 3  |
| ampicillin       | 25 17 |
| cefazolin        | 5  3  |
| ceftriaxone      | 41 15 |
| meropenem        | 42 0  |
| erythromycin     | 32 3  |
| azithromycin     | 8  2  |
| clarithromycin   | 30 1  |
| levofloxacin     | 16  1 |
| clindamycin      | 39  1 |
| vancomycin       | 2  40 |

S: Susceptible; I: Intermediate; R: Resistant

Table 3

| Serotype and levofloxacin resistant and macrolide resistant gene |
|---------------------------------------------------------------|
| Role | Infants | Adults | Total |
|------|---------|--------|-------|
| resistance | A | A | B | resistance | fA | A | ermB |
| IA    | 1 | 1 | 2 |
| IB    | 2 | 9 | 11 |
| III   | 1 | 3 | 4 |
| VIII  | 1 | 1 |
| NT    | 1 | 1 |
| Total | 2 | 9 | 24 |

Disclosures. All authors: No reported disclosures.

131. Duration of Therapy for the Treatment of Gram-Negative Bloodstream Infections

Stephanie Shulder, PharmD, BCIDP1; Matthew O’Connell, PharmD1; Kathryn I. Agedal, PharmD Candidate 20201; Kelly M. Conn, PhD, MPH1 and Kelly E. Pillinger, PharmD, BCIDP1; 1University of Rochester Medical Center, Rochester, New York; 2St. John Fisher College, Wegmans School of Pharmacy, LaFayette, New York; 3St. John Fisher College, Wegmans School of Pharmacy, Rochester, New York

Session: 37. Bacteremia, CLABSI, and Endovascular Infections

Thursday, October 3, 2019: 12:15 PM

Background. While current guidelines suggest a total treatment duration of 7 to 14 days for gram-negative bloodstream infections (GN-BSI), there is mounting evidence to suggest that shorter durations may be sufficient. This study compared the treatment outcomes of patients who received short duration therapy (6–10 days) with those who received longer durations (11–15 days).

Methods. This was a retrospective study of adult patients who grew an aerobic gram-negative organism from a blood culture while admitted at Strong Memorial Hospital between May 2016 and May 2018. The primary outcome was a composite of mortality and relapsed GN-BSI with the same organism within 90 days of index culture.

Results. A total of 42 GBS isolates (12 from children and 30 from adults) were collected. In adults, common underlying conditions were malignancy and diabetes, and primary bacteremia was the most common source of infection. In children, 6 were early-onset diseases, 4 were late-onset diseases, and 2 were school children. Overall, the mortality rate was 0% in children and 17% in adults. The serotypes and main clonal complex are summarized in Table 1. Minimum inhibitory concentrations of the antibiotics affects bacterial flora and induces selectivity of specific clones, thereby curbing the increasing rate of antibiotic resistance in Nara, Japan.

Conclusion. In clinical aspects, neonates with early-onset diseases experienced certain disorders during the perinatal period. In adults, serotype Ib, which tends to exhibit levofloxacin resistance, was the most common, followed by serotypes V and VI belonging to ST1; however, they were not observed in children. Contrastingly, serotype III belonging to ST335, which tends to exhibit macrolide resistance, was mainly observed in children. Quinolone among adults and macrolide among the younger generation are widely used as oral antibiotics in Japan. A tendency to use antibiotics affects bacterial flora and induces selectivity of specific clones, thereby curbing the increasing rate of antibiotic resistance in Nara, Japan.

Disclosures. All authors: No reported disclosures.

| Serotype and levofloxacin resistant and macrolide resistant gene |
|---------------------------------------------------------------|
| Role | Infants | Adults | Total |
|------|---------|--------|-------|
| resistance | A | A | B | resistance | fA | A | ermB |
| IA    | 1 | 1 | 2 |
| IB    | 2 | 9 | 11 |
| III   | 1 | 3 | 4 |
| VIII  | 1 | 1 |
| NT    | 1 | 1 |
| Total | 2 | 9 | 24 |

Disclosures. All authors: No reported disclosures.