Table 1. Bloodstream Infection Episodes in Allogeneic Stem Cell Transplant Recipients by Organism

| Organism                      | Number of Episodes |
|-------------------------------|--------------------|
| **Gram Positive Cocci**       |                    |
| Staphylococcus spp.           | 30                 |
| Streptococcus spp.            | 16                 |
| Enterococcus spp.             | 16                 |
| *Abiotrophia* spp.            | 1                  |
| **Gram Positive Bacilli**     | 7                  |
| **Gram Negative Cocci**       | 1                  |
| *Nesseria* spp.               | 128                |
| *Klebsiella* spp.             | 46                 |
| *Escherichia coli*            | 31                 |
| Other Enterobacteriaceae      | 25                 |
| *Pseudomonas* spp.            | 18                 |
| Other                         | 8                  |
| **Fungi**                     | 4                  |
| *Candida* spp.                | 4                  |
| **Total**                     | 223                |

Figure 1: Incidence of Bloodstream Infections (BSIs) Attributed to Acute Gastrointestinal Graft-Versus-Host Disease (GI GVHD) by Clinically-Diagnosed Grade

The vertical lines reflect confidence intervals (CI) including the estimated incidence of bloodstream infection by grade of clinically-diagnosed GI GVHD, depicted by the dots. Grade 0: Incidence 26.4, CI 21.6-31.5. Grade 1: Incidence 14.6, CI 8.3-23.2. Grade 2: 13.3, CI 4.1-28.1. Grade 3: Incidence 28.6, CI 2.5-53.3. Grade 4: Incidence 75, CI 36.3-92.2.

Disclosures. All authors: No reported disclosures.

226. Nine-year Survey of Bloodstream Infections (BSIs) across Six Types of Solid-organ Transplant (SOT) at a Large University Medical Center

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Session: 38. Transplant ID: Bloodstream Infections
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Background. BSIs are common in SOT patients. We surveyed BSIs across 6 types of SOT over 9 years at our center.

Methods. We conducted a retrospective study of BSI among patients transplanted from January 2010 to January 2019. Single blood cultures positive for coagulase-negative staphylococci, *Corynebacterium, Bacillus*, or *Propionibacterium* were excluded.

Results. 3,358 patients underwent SOT, including kidney (43%, 1,432), lung (23%, 778), liver (21%, 700), heart (8%, 256), pancreas (4%, 149), and small bowel/multivisceral (SB/MV 1%, 43). 16% (529) of patients had ≥1 episode of BSI. There were 770 BSIs; 14% (105/770) were recurrent. Median number of BSI was 1/patient (range: 1 to 7). BSI rates were highest among SB/MV patients (53%), followed by Lu (22%), Li (20%), H (14%) and K patients (14%) (Figure 1). 20% (156), 24% (187) and 7% (52) of BSIs occurred at ≤30 d, 31–180 d, and 181–365 d after SOT, respectively. BSI rates at ≤ and >180 d post-SOT were 3.6 and 0.65/1000 pt-d, respectively (P < 0.0001). Most common bacteria were Enterobacteriaceae (35%) and *Enterococcus* spp. (22%). *Candida* spp. accounted for 6% (49/770) of BSIs. *Enterobacteriaceae* were most common among intra-abdominal SOT patients, whereas Enterococcus and non-fermenting Gram-negatives were most common in Lu patients (Figure 2). 8% (65) of BSIs were polymicrobial. From 2016 to 2018, 15% (14/96) of Enterobacteriaceae BSIs were multi-drug-resistant (MDR); 8% (8/96) were extensively drug resistant (XDR). 23% (3/13) of *P. aeruginosa* were MDR (all XDR), 70% (1/20) and 5% (1/20) of *E. faecium* and *E. faecalis* were vancomycin-resistant, respectively. Thirty-day mortality following BSI diagnosis was highest for H (31%), followed by Lu (15%), Li (10%), P (9%) and SB/MV (4%) patients. Patients with bacteremia had higher mortality than patients with no bacteremia (Figure 3).

Conclusion. BSIs are common after SOT, and associated with significant short- and long-term mortality. Almost half of BSIs occur within the first 6 months of SOT, when BSI rates are significantly higher than at later time points. Predominant BSI pathogens differ between SOT types; as such, empiric antimicrobial therapy decisions should be organ-specific. At our center, MDR and XDR Gram-negative bacteria and VRE are common; centers should use overall SOT and organ-specific antibiograms to drive empiric antimicrobial strategies.

Disclosures. All authors: No reported disclosures.

227. Prevalence, Comorbidities and Expenditures of *S. aureus* Bacteremia in Liver Transplant Recipients: A 2012–2016 Nationwide Analysis

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Session: 38. Transplant ID: Bloodstream Infections
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Background. Bacteremia due to *Staphylococcus aureus* is a known complication of liver transplantation (LT). Studies have shown that LT recipients are more predisposed to *S. aureus* infections than other solid-organ transplant patients; however, these studies have been limited in scope and mostly based out of single centers.

Methods. This is a retrospective cohort study using 2012–2016 NIS, the largest public inpatient database in the United States. All patients with ICD9-10CM procedure codes for LT were included. The cohort was stratified into two groups depending on whether they had MSSA or MRSA infection. The odds of inpatient mortality in both groups of patients undergoing LT were determined. The inpatient mortality odds were then compared with those of patients undergoing LT without associated infection. Other outcomes included inpatient morbidity, resource utilization, hospital length of stay (LOS), and inflation-adjusted total hospital costs and charges.
Multivariate regression analyses were used to adjust for demographic variables and Charlson Comorbidity Index.

**Results.** A total of 26,415 patients underwent LT in the study period, of which 180 had MSSA and 160 had MRSA infection reported. The mean age was 51.5 years and 35.6% were female. Patients with MSSA and MRSA displayed significantly higher inpatient mortality rates (11.1% and 9.4%, respectively) compared with non-MSSA/MRSA patients (3.4%) who underwent LT ($P < 0.01$). After adjusting for confounders, patients with MSSA infection displayed higher mortality odds (aOR: 4.45, $P < 0.01$), while patients with MRSA infection had non-statistically significant higher inpatient mortality odds (aOR: 3.10, $P = 0.12$) compared with patients without MSSA/MRSA infection. Both MSSA and MRSA cohorts displayed higher mortality odds if the infection resulted in sepsis (aOR: 9.92 and 5.70, respectively; $P < 0.01$).

**Conclusion.** There is a direct correlation between *S. aureus* bacteremia and increased mortality rates and incidence of sepsis and shock in LT recipients. Patients with *S. aureus* bacteremia spent more days in hospital and had higher cost of healthcare. Preventing and aggressively treating *S. aureus* infections in the immediate post-LT setting is key to reducing mortality, morbidity and resource utilization in patients undergoing LT.

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

228. Early Recurrent Postoperative Bloodstream infections in Living-Donor Liver Transplant Recipients

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S. aureus bacteremia spent more days in hospital and had higher cost of healthcare. Preventing and aggressively treating *S. aureus* infections in the immediate post-LT setting is key to reducing mortality, morbidity and resource utilization in patients undergoing LT.

**Methods.** All LDLT-Rs with follow-up data between January 2008 and December 2016 were included. Early BSI (EBSI) defined as BSI events within 2 months after LDLT. ER-BSI was defined as new-onset BSI within 2 months due to another pathogen 48-hour interval, or relapse of BSI by the same pathogen -40), and Diarrheal stool samples (n = 80). Antibiotic susceptibility test was done using the Kirby–Bauer disc diffusion method. Phenotypic detection of ESBL enzyme was done by Double disk diffusion test. PCR analysis was carried out for β-lactamase gene TEM, SHV, CTX-M. Molecular Typing was done by RAPD.

**Results.** Among 727 LDLT-Rs, 108 patients had 149 events with 170 isolated pathogens of E-BSI. The most common bacteria were *S. aureus* (36.7%) and *Escherichia coli* (24.7%). The most common pathogen in the first episode of E-BSI and even significantly more (59.3% vs. 82.9%, $P = 0.007$). Intra-abdominal and/or biliary complications were risk factors for both E-BSI and ER-BSI. Whereas high MELD score, longer cold ischemic time and longer recipient operative time were associated with E-BSI, longer post-transplant intensive care unit stay and longer donor operative time was associated with ER-BSI. 1-year survival rates of patients with or without single event of E-BSI were 81.3% and 92.4%, respectively. Patients experiencing ER-BSI showed significantly low 1-year survival rates of 28.6% (Figure 1). ER-BSI was the most relevant risk factor for 1-year mortality (adjusted OR = 8.26; 95% CI: 4.30–15.88).

**Conclusion.** LDLT-Rs with ER-BSI showed very low survival rates accompanying with intra-abdominal and/or biliary complications. Clinicians should be aware to prevent recurrence of BSI focusing on intra-abdominal complications in order to improve clinical outcomes of LDLT-R.

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

229. Molecular Typing by RAPD, Characterization and Antibiotic Resistance Profile of ESBL Producing and Non-ESBL Producing Klebsiella Species Isolated From Diarrheal Stool and Environmental Samples

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**Session:** 39. Diagnostics: Sequencing and Typing

**Thursday, October 3, 2019: 12:15 PM**

**Background.** Extended-spectrum β-lactamase is a major public health problem in hospitals and community that mediate resistance to Penicillin, Cephalosporins, and Monobactams. Data regarding the detection of TEM, CTX-M, and SHV genes by molecular techniques and typing by RAPD in ESBL producing bacteria can be useful in epidemiology and risk factors associated with infections.

**Methods.** Total of 140 samples were collected. Well water (n = 50), Fish effluents (n = 40), and Diarrheal stool samples (n = 80). Antibiotic susceptibility test was done using the Kirby–Bauer disc diffusion method. Phenotypic detection of ESBL enzyme was done by Double disk diffusion test. PCR analysis was carried out for β-lactamase gene TEM, SHV, and CTX-M. Molecular Typing was done by RAPD.

**Results.** A total of 26,415 patients underwent LT in the study period, of which 180 had MSSA and 160 had MRSA infection reported. The mean age was 51.5 years and 35.6% were female. Patients with MSSA and MRSA displayed significantly higher inpatient mortality rates (11.1% and 9.4%, respectively) compared with non-MSSA/MRSA patients (3.4%) who underwent LT ($P < 0.01$). After adjusting for confounders, patients with MSSA infection displayed higher mortality odds (aOR: 4.45, $P < 0.01$), while patients with MRSA infection had non-statistically significant higher inpatient mortality odds (aOR: 3.10, $P = 0.12$) compared with patients without MSSA/MRSA infection. Both MSSA and MRSA cohorts displayed higher mortality odds if the infection resulted in sepsis (aOR: 9.92 and 5.70, respectively; $P < 0.01$).

**Conclusion.** There is a direct correlation between *S. aureus* bacteremia and increased mortality rates and incidence of sepsis and shock in LT recipients. Patients with *S. aureus* bacteremia spent more days in hospital and had higher cost of healthcare. Preventing and aggressively treating *S. aureus* infections in the immediate post-LT setting is key to reducing mortality, morbidity and resource utilization in patients undergoing LT.

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

230. Molecular Typing of Streptococcus pyogenes Isolates Collected at Mongolian Hospital (Ulaanbaatar, Mongolia)

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**Session:** 39. Diagnostics: Sequencing and Typing

**Thursday, October 3, 2019: 12:15 PM**

**Background.** *Streptococcus pyogenes* is a significant cause of morbidity and mortality worldwide causing an estimated 1.8 million cases and 517,000 deaths each year. Multivariate regression analyses were used to adjust for demographic variables and Charlson Comorbidity Index.

**Results.** A total of 26,415 patients underwent LT in the study period, of which 180 had MSSA and 160 had MRSA infection reported. The mean age was 51.5 years and 35.6% were female. Patients with MSSA and MRSA displayed significantly higher inpatient mortality rates (11.1% and 9.4%, respectively) compared with non-MSSA/MRSA patients (3.4%) who underwent LT ($P < 0.01$). After adjusting for confounders, patients with MSSA infection displayed higher mortality odds (aOR: 4.45, $P < 0.01$), while patients with MRSA infection had non-statistically significant higher inpatient mortality odds (aOR: 3.10, $P = 0.12$) compared with patients without MSSA/MRSA infection. Both MSSA and MRSA cohorts displayed higher mortality odds if the infection resulted in sepsis (aOR: 9.92 and 5.70, respectively; $P < 0.01$).

**Conclusion.** There is a direct correlation between *S. aureus* bacteremia and increased mortality rates and incidence of sepsis and shock in LT recipients. Patients with *S. aureus* bacteremia spent more days in hospital and had higher cost of healthcare. Preventing and aggressively treating *S. aureus* infections in the immediate post-LT setting is key to reducing mortality, morbidity and resource utilization in patients undergoing LT.

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