1540. Left Ventricular Assist Device Driveline Infections: Relapsed Infections and Minimum Inhibitory Concentration Changes
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Background. Yersinia enterocolitica is usually transmitted through ingesting or handling undercooked pork products and is an uncommon cause of diarrhea, mesenteric adenitis and bacteremia in the United States. There is limited information regarding its clinical course in immunosuppressed and cancer patients. We describe the clinical presentation and outcomes of cancer patients diagnosed with Y. enterocolitica at a Comprehensive Cancer Center in the United States before and after the use of nucleic acid amplification testing (NAAT) using GI multiplex panel (GIMP).

Methods. We studied all patients with Y. enterocolitica isolated from cultures or identified by NAAT. We then obtained demographic information, comorbidities, co-infections, clinical characteristics, treatment and overall mortality at 30 days post diagnosis.

Results. Sixteen cases were identified (Table 1). The most common symptom of Y. enterocolitica infection was diarrhea [10/16 (62%)], followed by abdominal pain [8/16 (50%)] and fever [4/16 (25%)]. Ten of the cases were identified by NAAT over a 2-year period, compared with six cases identified prior to April 2016 over 70 years. Stool cultures confirmed Y. enterocolitica infection in two cases identified by NAAT (20%). Three patients had co-infection with Clostridium difficile, and four patients had a history of C. difficile infection. All but one patient was treated, mostly with a fluoroquinolone. Thirty-day mortality was 7.7%. Cause of death was most often a complication of advanced cancer. The one patient who did not receive antibiotics had maxillary sinus squamous cell cancer and had spontaneous resolution of symptoms.

Conclusion. GIMP NAATs have increased the rates of Y. enterocolitica identification in patients with cancer, suggesting that this disease was under-diagnosed or is now more common as patients receive increasingly intensive immunosuppression. GIMP NAATs will likely re-define the epidemiology of Y. enterocolitica infection in cancer patients. In patients with Y. enterocolitica who are at high risk for C. difficile relapse and in whom no recent immunosuppression or evidence of systemic illness is present, it may be reasonable to consider observation or shorter course of antibiotics.

1541. Infectious Complications in Adult Patients with Hemophagocytic Lymphohistiocytosis: A Single-Center Experience
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Background. Hemophagocytic lymphohistiocytosis (HLH) is a rare hematologic disorder that is characterized by excessive immune activation. In adults, it is typically secondary to an underlying process such as autoimmune disease, infection, or malignancy. Guidelines based on expert opinion suggest prophylaxis (PPX) with antiviral, antibacterial, and/or antifungal agents for patients undergoing treatment for HLH; however, the incidence of infectious complications is not known. We aimed to study the scope of infection in patients with HLH to help determine the best strategy for antimicrobial PPX.

Methods. We performed a retrospective chart review of 56 adult patients who fulfilled clinical diagnostic criteria for HLH treated at Stanford University Hospital between 2012 and 2018. Infections diagnosed up to 1 month prior and up to 6 months after a diagnosis of HLH were reviewed.

Results. A total of 57 episodes of HLH in 56 patients were reviewed. Infection was determined to be the trigger of HLH in five cases (EBV in three cases, Histoplasma in one case, MAC or HHV6 in one case). Antiviral PPX was used in 72%, PCP PPX in 75%, and antifungal PPX in 77% of HLH episodes. At least one infectious complication occurred in 33 of 57 episodes of HLH (58%) with 69 total infections diagnosed after HLH diagnosis: 46 bacterial, 12 viral, and 11 fungal. Bacterial infections included bac teremia (43%), pneumonia (15%), skin and soft tissue (13%), intra-abdominal infection (11%), urinary tract infection (13%), and others (5%). Of the viral infections, CMV viremia was the most prevalent and occurred in four patients (7% of HLH episodes). Fungal infections occurred in 19% of HLH episodes and included four yeast and seven mold infections (five proven and two possible). Three of these cases were not receiving antifungal PPX prior to infection; the remaining eight were breakthrough infections.

Conclusion. Infectious complications of HLH are common, and likely result from a combination of host immune factors related to underlying disease and induced by immunosuppressive chemotherapy. Most noteworthy is the incidence of fungal infections which supports the use of antifungal PPX in this patient population. Even with this, breakthrough infection, including with opportunistic molds, is not uncommon.

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1542. Infectious Complications in Patients Following Umbilical Cord Blood Transplant (UCBT) for Hematologic Malignancy
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Background. UCBT can be performed in pt with hematologic malignancies who do not have a matched donor, but engraftment often takes longer than with a standard allogeneic stem cell transplant. Delayed engraftment can increase the risk for infections, but characteristics of specific infections & outcomes have not been well characterized in adults undergoing UCBT.

Methods. All patients who underwent UCBT between January 1, 2006 and January 1, 2016 at our two centers were included. Infections episodes within 6 months before and up to 2 years after UCBT were reviewed.

Results. Fifty-seven patients underwent UCBT. Mean age was 43 ± 14 years, and 34 patients were women. Thrity-nine (60%) had acute leukemia. Only 47 patients had neutrophil engraftment. One hundred and seventy-nine infectious episodes occurred in 55 patients, 73 (41%) within 30 days post-UCBT. Viruses caused 85 (47%) infections. HHV-6 occurred in 28 episodes, 24 of which were viremia alone, and was most common within 30 days of UCBT. One patient died of HHV-6 encephalitis. CMV caused 32 infections episodes. 24 of which were viremia only, was most common from Days 30–100, and caused no deaths. BK viruria occurred in 18 episodes. Bacteria were responsible for 82 (46%) infections; most common were bacteremias due to Staphylococcus, van-R Enterococcus and Enterobacteriaceae. Three patients had mycobacterial infections, two of which were fatal. Of 11 invasive fungal infections (IFI), nine were invasive aspergillosis, of which four were fatal. Overall mortality was 56% in the first year, including 13 deaths from infection. Eleven of these 13 infections occurred in the first 100 days post-UCBT and seven of them in the first 30 days. Patients who died within 180 days were significantly more likely to have had IFI (P = 0.04) or infection with VRE (P = 0.03) or Enterobacteriaceae (P = 0.03) within 30 days after UCBT. Among the 10 patients who never had neutrophil engraftment, nine died within 100 days post-UCBT, six from infection.

Conclusion. Infectious complications were common after UCBT, especially in the first 30 days. Deaths from viral infections were fewer than expected, most likely because of increased screening and prophylaxis for CMV infections. Delayed engraftment and nongraft failure continue to convey increased risk for fatal bacterial and fungal infections post-UCBT.

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1543. The More Resistant, the More Fatal: Results of 414 Bacteremia Episodes in FEBRIL Neutropenic Patients
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Background. The objective of this study was to investigate the features of antimicrobial resistance in the microorganisms isolated from blood cultures of cases with FN and the relationship between resistance and mortality rates.

Methods. We conducted a single-centre retrospective surveillance study of hospitalized cases with FN who had bloodstream infection (BSI) between 2012 and 2016. Organisms were identified according to current conventional procedures.

Results. We determined 414 episodes of BSI in 252 patients of whom 53.6% were male and median age was 50 years. Distribution of common microorganisms causing BSI is presented in Figure 1. Rates and patterns of resistant microorganisms are presented in Table 1 and Figure 2. Catheter-related bacteremia constituted 49.8% (206/414) of total episodes and 30-day mortality was significantly lower (P = 0.007) in this group. In total, 30-day crude mortality rate was 14.7% (61/414 episodes). The mortality rates were 7.4, 18.6, 32.4 and 50% in BSI episodes due to Gram-positive, Gram-negative bacterial, polymicrobial and fungal etiology, respectively. Among Gram-negatives 30-day mortality was significantly associated with the presence of resistance; extended-spectrum β-lactamase (ESBL) (P = 0.006), carbapenem resistance (P < 0.0001), piperacillin/tazobactam resistance (P < 0.0001) and colistin resistance (P = 0.0009). Among Gram-positives 30-day mortality was not associated with presence of resistance.

Conclusion. The rate of carbapenem and colistin resistance has increased over the years. Changing antimicrobial resistance pattern particularly in Gram negatives is among the most decisive parameters for the success of empirical treatment and anti-microbial stewardship.

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Table 1: Resistance Profiles of Common Isolates

| Microorganisms | ESBL(+) | Carbapenem Resistance | Colistin Resistance | Multi Drug Resistance (MDR) | Methicillin Resistance | Vancomycin Resistance |
|----------------|---------|-----------------------|--------------------|-----------------------------|-----------------------|---------------------|
| Escherichia coli (n = 82) | 31 | 7 | 0 | 28 | — | — |
| Klebsiella spp. (n = 64) | 42 | 24 | 6 | 41 | — | — |
| Pseudomonas spp. (n = 31) | — | 13 | 0 | 13 | — | — |
| Acinetobacter baumannii (n = 17) | — | 14 | 2 | 12 | — | — |
| Coagulase negative staphylococci (n = 172) | — | — | — | 141 | 0 | — |
| Staphylococcus aureus (n = 6) | — | — | — | — | 1 | 0 |
| Enterococcus spp. (n = 20) | — | — | — | — | — | 8 |

Figure 1. Distribution of pathogens.

Figure 2. Rate of resistant microorganisms.

1544. Kinetics of BK Virus in Urine Associated with BKV DNAemia and BKVAN in Pediatric Kidney Transplantation
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Background. BK polyoma virus (BKV) is an important pathogen for immunocompromised children. After kidney transplantation (KTx), asymptomatic BKV DNAemia and further BKV associated nephropathy (BKVAN) may result in damage or loss of allograft. BKV DNA are usually detected in urine preceding the development of BKV DNAemia and BKVAN; therefore urine BKV loads can be used for screening. However, the correlation between its kinetics and clinical outcome is not fully investigated, especially in pediatric KTx recipients, who often develop primary BKV infection after KTx. The purpose of this study was to analyze the kinetics of urine BKV load after KTx to correlate the clinical outcome such as BKV AN, BKV DNAemia and rejection.

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