Evaluation of Clostridium difficile Infection in Pediatric Hematology/oncology Patients
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Background:
The incidence of Clostridium difficile infection (CDI) in pediatric patients increased by 55% from 2001 to 2006 and children with cancer have 15% more risk of CDI. Pediatric oncology patients are especially vulnerable to CDI due to their underlying malignancies, exposure to chemotherapy, broad-spectrum antibiotics, and supportive medications. CDI can lead to prolonged hospital admissions and increased mortality. For mild to moderate CDI, the American Academy of Pediatrics (AAP) recommends treatment with oral or intravenous metronidazole. For severe CDI, oral or rectal vancomycin with or without intravenous metronidazole is recommended. The AAP suggests that severe disease is more common in neutropenic children with leukemia; however, no CDI guidelines exist for pediatric oncology patients.

Objective:
This study aimed to determine the incidence of CDI, and trends in medication therapy for CDI in pediatric oncology patients at an academic medical center. Secondary objectives were to assess treatment outcomes, CDI risks factors, and recurrence rate at our institution.

Methods:
A retrospective chart review using the electronic medical record was conducted from April 1, 2014 to September 10, 2016. Patients 0-18 years of age who were admitted to the inpatient hematology/oncology service were included. Those with sickle cell disease were excluded. Data collected included demographic information, oncology diagnosis, chemotherapy agents, CDI data, antibiotic therapy, treatment duration, and time to relapse CDI.

Results:
Within the study period, 555 patients met inclusion criteria and 27 patients (4.9%) were positive for CDIs. CDI recurrence occurred in 5 (18.5%) patients, and 1 (3.7%) patient had a second CDI episode. Most patients were Caucasian (51.9%) males (70.4%) with a median age of 8 years (0-18 years). The most common malignancies were B-ALL (37%), osteosarcoma (14.8%), and AML (11.1%). Potential risk factors included chemotherapy (97%), antibiotics (81.8%), acid suppressant (51.5%), and steroid (27.3%) use within the previous two weeks. For the first episode, 74% of patients were treated with oral metronidazole for 7-18 days. Of the 5 patients with recurrence, 4 were treated with oral metronidazole for the first episode and 3 were treated with oral metronidazole again for the second episode. Only one patient was prescribed a vancomycin taper after a course of metronidazole for his recurrence.

Conclusion:
The incidence of CDI at our institution is within the documented rates (3.2-11.9%) for pediatric hematology/oncology patients. The most common treatment regimen for first episode was oral metronidazole. However, patients that had recurrence were all treated with oral metronidazole at initial episode, while those treated with IV metronidazole or oral vancomycin therapy did not show recurrence. Future studies are needed to determine the most effective first line therapy in pediatric hematology/oncology patients with CDI.