Using Quality Improvement Methods to Prevent Clostridium difficile Infection in Pediatric Hematology/Oncology Patients

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Introduction

- Clostridium difficile (C. difficile) is the leading cause of hospital-associated diarrhea in the U.S.
- Patient risk factors for C. difficile infection (CDI) include antimicrobial exposure, hospitalization, immunocompromised or chronic health conditions, chemotherapy and use of proton pump inhibitors
- External risk factors are contact with a healthcare worker, contact with contaminated environment, or direct contact with a CDI patient
- Due to the nature of their disease, many of these risk factors are unavoidable in Pediatric Hematology/Oncology
- At Stony Brook Children’s Hospital, the rate of CDI in Pediatric Hematology/Oncology patients prior to this initiative was 48.6/10,000 patient days.

Materials

- We assembled a multidisciplinary team with representation from Hematology/Oncology, Infectious Diseases, Infection Control, Microbiology, Nurse Practitioners, House Staff, Respiratory Therapists, Hospital Custodial Staff (HCS) and Quality Improvement
- The team measured baseline and post intervention CDI rate on the Pediatric Hematology/Oncology (PHO) unit
- We created and presented educational interventions in the form of a power-point presentation for medical, nursing, ancillary and custodial staff and brochures for patient families
- We created daily/terminal cleaning checklists for hospital custodial staff to standardize cleaning practices
- The team assessed staff knowledge of CDI with pre and post-educational questionnaires
- We monitored appropriate test ordering for CDI, pre and post education
- We observed cleaning practices of the hospital custodial staff using standardized check lists
- The team observed Personal Protective Equipment (PPE) use and handwashing techniques
- We performed bioburden tests in playrooms in the Cancer Center and in the hospital as well as the Pediatric Hematology/Oncology patient rooms
- Statistical analyses tools used included Wilcoxon-Rank Sums, Chi-Square one way approximation

Discussion

- Though not statistically significant, there was a clinically significant decline in CDI noted.
- Our initiative raised awareness of hospital staff in multiple disciplines on CDI recognition and prevention.
- We standardized educational materials and developed CDI testing protocol.
- This led to enhanced assessment and efficacy of environmental cleaning practices.
- We recognize the need for continuing in-person education for physicians similar to recertification for nursing staff.

Limitations:

- Turnover of staff impacted efficacy of education
- Limited number of bioburden tests performed
- There was a gap between provision of education and post education surveys which may have impacted on knowledge gains; this reinforces the need for continuing education

Conclusions

- A multidisciplinary approach with particular reference to the hospital custodial staff is essential to limiting the spread of CDI
- PPE and handwashing are critical to reduce the spread of infection
- Identification of appropriate patients to test reduces over-diagnosis and treatment of carriers
- Playroom toys if not properly cleaned may contribute to spread of CDI
- Bioburden assessment is an important tool to help evaluate cleaning practices
- Continuing education on importance of PPE, handwashing techniques and daily/terminal cleaning is key to preventing outbreaks of CDI

References