Letters to the Editor

Differing Epidemiology of *Clostridium difficile*-Associated Diarrhea Between an Oncology Ward and a General Medicine Ward

To the Editor:

We have observed a clear difference in the epidemiology of endemic *Clostridium difficile*-associated diarrhea (CDAD) between the oncology and general medicine wards at our institution. The oncology ward is a 32-bed unit housing surgical and medical oncology patients receiving antineoplastic therapy and bone marrow transplants. The general medicine ward is a 41-bed unit consisting of a 4- to 6-bed acquired immunodeficiency syndrome unit and geriatric and general medicine patients. In the oncology ward, no correlation was found between isolates from patients and those from the environment,[1] whereas in the general medicine ward, a predominant environmental isolate was associated with 81.8% of CDAD cases. We undertook a study of patient-centered risk factors to determine if differences between these two groups of patients contributed to the differences observed in epidemiological patterns. A cohort study design was used to examine known risk factors for CDAD (Table). Cohorts compared were patients with CDAD on the oncology ward (n=21) and those with a variety of illnesses on the general medicine ward (n=9). Univariate analyses were performed using the chi-square and Mann-Whitney methods, as appropriate. Multivariate analysis was not possible due to the small sample size and the strength of the association between certain risk factors and one cohort or the other. Analysis of patient-centered risk factors showed no statistically significant differences between the two groups of patients with respect to use of antibiotics, antacids, feeding tubes, history of prior CDAD, diabetes mellitus, alcoholism, recent gastrointestinal surgery, or endoscopy (Table). Certain risk factors, such as exposure to antineoplastic chemotherapy or steroids, and presence of hematologic malignancy or solid tumors were strongly associated with the oncology ward, while history of pneumonia or human immunodeficiency virus infection were associated with the general medicine ward. Antibiotic exposure scores (number of antibiotics utilized times days of treatment) were similar for the two groups (means, 16 for general medicine ward and 9.5 for the oncology ward; P=.188).

TABLE
RISK FACTORS

Risk Factors	No. of Patients With Risk Factors/ Total No. of Patients: General Medicine Ward	No. of Patients With Risk Factors/ Total No. of Patients: Oncology Ward	*P*
Pneumonia	7/9	1/21	.000034
Chemotherapy	0/9	12/21	.0034
HIV infection	4/9	1/21	.0075
Hematologic malignancy	0/9	9/21	.019
Steroids	1/9	12/21	.020
Solid tumors	0/9	8/21	.030
Laxatives	0/9	7/21	.048
Prophylactic antibiotics	4/9	3/21	.073
Prior *Clostridium difficile* infection	4/9	3/21	.073
GI surgery	0/9	5/21	.109
Alcoholism	2/9	1/21	.144
Bone marrow transplant	0/9	7/21	.160
Antacids	4/9	14/21	.255
Diabetes mellitus	0/9	2/21	.338
Endoscopy	0/9	1/21	.506
Feeding tube	1/9	4/21	.593

Abbreviations: GI, gastrointestinal; HIV, human immunodeficiency virus.

The major differences in risk factors for CDAD on the two units reflected the differences in the patient populations. We found no particular patient-centered risk factor accountable for the differing modes of acquisition of CDAD, implying that external factors such as healthcare practices, nursing-assignment patterns, cleaning schedules, etc, may have accounted for the differing epidemiology. In the general medicine ward, the nurse-patient ratio is one nurse per five to six patients, with changes in nurse staff being common. In the oncology ward, on the other hand, nurses are assigned permanently to specific patients for the duration of the hospitalization, with a ratio of one nurse per four patients. In addition, in the general medicine ward, hospital assistants constitute a significant percentage of the healthcare personnel. We found no difference in the cleaning pattern of the two wards, in which usual quaternary ammonium compounds were used. Environmental sampling was performed prior to the daily cleaning in both cases. Cross-transmission and environmental contamination appear to play an important role in the general medicine ward, suggesting that patient-care practices are important determinants of infection in this ward. The diversity of strains in the oncology ward supports the possibility of an endogenous source of infection. Our observations in the oncology ward also have been reported by others who identified a wide variety of *C dif-*

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ficile types among clustered cases of diarrhea.[2,3] We hypothesize that some factors that may contribute to the differences observed are larger patient population with a higher turnover rate; higher number of healthcare personnel in the general medicine ward as compared to the oncology ward; and the lack of protective practices to decrease infection rates of immunocompromised hosts (such as single rooms) in the general medicine ward. Further studies with larger groups of patients and an analysis of some of these external factors are in progress.

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Primary Bacteremia and Needleless Safety Devices

To the Editor:

The incidence of needlestick injuries (NIs) continues to be high in healthcare workers (HCWs). There are recommendations aimed at reducing the incidence of NI, as it poses the risk of transmission of bloodborne infections between HCWs and patients. It is an issue of great concern from both the employee and employer perspective. Many hospitals have implemented various types of safety devices to reduce NI incidents. One of the safety devices used is a needleless vascular access system. The effects of the implementation of such needleless systems on the incidence of nosocomial primary bacteremias have been contradictory.[1-3] The objective of our study was to determine the effect of needleless safety devices on primary bacteremia in our hospital.

Arlington Hospital is a 350-bed acute-care community teaching hospital located in northern Virginia, with approximately 1,500 HCWs and an average of 16,000 patient admissions per year. We adopted an NI prevention program in 1992.[4] One of the components of our NI prevention program was the use of a needleless vascular access system.

All new safety devices for the NI prevention program were reviewed by the NI Prevention Committee and then evaluated by the prime users of the products. New device selection criteria were safety, user acceptance, device simplicity, patient satisfaction, infection risk, passive operation, and lack of need for disassembly for disposal after use. Because a substantial number of NIs were related to intravenous (IV) therapy, IV safety was the first priority addressed in this hospital. After evaluation by the nursing department, the committee approved the use of Braun Safsite Needleless Systems (B. Braun Medical Inc, Bethlehem, PA).

All primary bacteremia or bloodstream infections (BSIs) from 1989 to 1997 were reviewed using the Centers for Disease Control and Prevention's criteria for nosocomial infections. BSI before and after implementation of the needleless devices were calculated and compared for trend and clusters. No trend, cluster of infections or organisms, or outbreaks were noted during the study period. Rates of BSI before and after implementation of the Braun Safsite needleless devices were comparable. During the study period, the patient census did not change significantly. BSI rates also were calculated for coagulase-negative staphylococci, *Staphylococcus aureus*, aerobic gram-negative bacilli, *Candida* species, enterococci, and others. The distribution of organisms did not change significantly during the study period.

This 6-year surveillance study after the implementation of the Braun Safsite Needleless Systems suggests that its use was not associated with any increase in BSI.[3]

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