components. For MRSA, the 2 most common IPC interventions were hand hygiene campaigns (100 [49%] of 204) and contact isolation (84 [41.2%] of 204); 18 (8.8%) of 204 reported use of IPC bundle C, and 10 (4.9%) of 204 reported use of IPC bundle D. Compliance ranged from 20% to 94% for all IPC components. By multivariate analysis, no significant reduction in MDR *A. baumannii* or MRSA infection was evident among hospitals with less than 60% IPC compliance. Over the 1-year period, there were significant reductions in MDR *A. baumannii* among hospitals with 60%–80% compliance to IPC bundles A and B and significant reduction in MRSA among hospitals with 60%–80% compliance to IPC bundle D (Table 1). Having greater than 80% compliance with hand hygiene, contact isolation, ASP, and IPC bundles were associated with reduction in MDR *A. baumannii* and MRSA infection.

Our study findings emphasize the need for multifaceted interventions featuring a "horizontal" approach to control the spread of MDR *A. baumannii* and MRSA.[4,5] We acknowledge that the report of these survey findings includes limitations of sample size and recall biases related to survey design, execution, and analysis. Despite such limitations, we have identified modifiable gaps and opportunities for implementation of IPC bundles to limit transmission of MDR *A. baumannii* and MRSA in resource-limited settings.

ACKNOWLEDGMENTS

Financial support. This study was supported by the National Research University Project of the Thailand Office of Higher Education Commission (to A.A.).

Potential conflicts of interest. L.M.M. reports that she is an employee of GlaxoSmithKline (GSK) and that this work was conducted pro bono and independently of GSK. A.A. declares no conflicts of interest relevant to this article. All authors submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest, and the conflicts that the editors consider relevant to this article are disclosed here.

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Infect Control Hosp Epidemiol 2014;35(2):207-208

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Germ and Hematology: Underlying Disease Influences Diversity of Germ Spectra and Antibiotic Therapy

To the Editor—Knowledge of microbiological germ spectra is a crucial prerequisite for calculated and empirical antibiotic therapy, especially for immunocompromised patients. The microbiological spectra of hematology patients, irrespective of the isolation site, may differ from that of other patients, and taking this into consideration may substantially influence the choice of antibiotics at admission, especially in an outpatient setting or in emergency departments. To elucidate the potential variability of microbiological spectra, we analyzed all consecutive admissions of patients with infectious complications at the Medical Center of the Otto-von-Guericke University in Magdeburg, Germany, over an 18-year period from January 1992 through December 2009. In this retrospective, single-center study, the microbiological isolates obtained from collected patient samples from the Department of Hematology and Oncology (hematology department patients [HP], who were mostly patients with acute leukemia and lymphoma) were compared with those obtained from all other departments (non–hematology department patients [NHP], who were treated in the medical and surgical departments).

Within the relevant period, 603,944 pathogens were isolated, of which 21,431 (3.5%) were obtained from HP. When comparing HP with NHP, the most frequent isolates were derived from blood cultures (43.2% vs 15.8%; $P < .001$) with an overall predominance of gram-positive bacteria. In HP specimens, the proportion of gram-positive bacteria was significantly higher than in NHP specimens (67.4% vs 58.4%; $P < .001$). Anaerobic bacteria were found less frequently in HP samples than in NHP samples (0.6% vs 1.0%; $P = .02$). No difference was detectable between the groups with respect to yeasts. *Staphylococcus aureus*, *Enterobacteriaceae*, and *Pseudomonadaceae* were significantly less frequent among HP than among NHP, whereas the prevalence of coagulase-negative

https://doi.org/10.1086/674864 Published online by Cambridge University Press

TABLE 1. Frequency of Isolated Pathogens, 1992–2009 (n = 603,944)

Pathogen	No. (%) of hematology patients (n = 21,431)	No. (%) of nonhematology patients (n = 582,513)	P
Aerobic bacteria	19,374 (90.4)	521,349 (89.5)	.50
Staphylococcus aureus	1,050 (4.9)	55,921 (9.6)	<.001
Coagulase-negative *Staphylococcus* species	6,772 (31.6)	114,173 (19.6)	<.001
Streptococcus species	3,472 (16.2)	69,902 (12.0)	.01
Enterococcus species	2,207 (10.3)	61,746 (10.6)	.61
Gram-negative cocci	1,136 (5.3)	16,893 (2.9)	.10
Enterobacteriaceae	2,657 (12.4)	112,425 (19.3)	<.001
Non-*Enterobacteriaceae*	407 (1.9)	7,573 (1.3)	.17
Gram-negative rods	193 (0.9)	12,233 (2.1)	<.001
Pseudomonadaceae	557 (2.6)	32,621 (5.6)	<.001
Gram-positive rods	986 (4.6)	37,281 (6.4)	.001
Gram-positive bacteria	14,444 (67.4)	340,188 (58.4)	<.001
Gram-negative bacteria	6,987 (32.6)	242,325 (41.6)	<.001
Anaerobic bacteria	129 (0.6)	5,825 (1.0)	.02
Yeasts	1,929 (9.0)	55,339 (9.5)	.70

NOTE. The frequency of isolates obtained from hematology patients was compared with that of isolates obtained from nonhematology patients using Student t test. Two-sided P values < .05 were considered to be statistically significant.

Staphylococcus species (CNS) and *Streptococcus* species appeared to be significantly increased (Table 1).

Analyzing the 2,226 aerobe isolates grown in blood cultures obtained from all consecutive febrile HP, we found that isolates were predominantly CNS (46.3%) followed by *Enterobacteriaceae* (19.0%), *Streptococcus* species (9.4%), *S. aureus* (6.2%), *Enterococcus* species (5.8%), and *Pseudomonadaceae* (4.5%).

Analyzing potential changes in germ spectra over time, we compared specimens obtained during the period 1992–2000 with those obtained during 2001–2009. Here, an increase in gram-positive bacteria could be observed in both HP (+9.0%; P = .002) and NHP (+2.7%; P = .002), with no change detectable for either gram-negative bacteria or anaerobes. The frequency of yeasts was significantly reduced over time in HP (−6.0%; P = .006), which may be attributed to antifungal prophylaxis, whereas it remained stable in NHP. Of note, significant increase was evident for *S. aureus* in HP (+2.7%; P = .03) and NHP (3.1%; $P < .0001$).

Microbiological spectra vary between general internal medicine and HP populations.[1,2] In our study, in the HP group, the most pronounced differences were seen for CNS (probably related to contaminated blood culture specimens) and *Enterobacteriaceae*. Over time, the frequency of gram-positive isolates was increasing in both of the cohorts that we compared. For the HP group, this increasing predominance of gram-positive bacteria during the past several decades may be attributed to the generous use of antibiotic prophylaxis, especially fluoroquinolones, as well as the more frequent use of central venous catheters and the increase in cases of oral mucositis.[3]

Taken together, our data provide evidence that calculated and empirical antibiotic regimens for patients with hematologic diseases should provide sufficient activity against gram-positive bacteria. Knowledge of the local bacterial spectrum and their susceptibility patterns as well as prompt initiation of effective antibiotic therapy are essential for patients with hematological malignancies, because inadequate initial antibiotic therapy is a significant predictor of mortality.[4] This information may be of special interest for primary care providers who initiate antibiotic therapy for HP at admission.

Because resistance rates among HP have increased to 25%–63% of tested antibiotics against CNS, methicillin-susceptible *S. aureus*, *Enterobacteriaceae*, *Pseudomonadaceae*, *Streptococcus* species, and *Enterococcus* species,[5] antimicrobial stewardship is clearly warranted to restrict use of prophylactic antibiotics. This is of special importance, because invention of new antibiotic drugs is not keeping pace with the development of resistance.[6]

ACKNOWLEDGMENTS

Potential conflicts of interest. All authors report no conflicts of interest relevant to this article. All authors submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest, and the conflicts that the editors consider relevant to this article are disclosed here.

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Infect Control Hosp Epidemiol 2014;35(2):208-210

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