REFERENCES

1. Bartlett JG. *Clostridium difficile*: progress and challenges. *Ann NY Acad Sci* 2010;1213:62–69.
2. Magill SS, Edwards JR, Bamberg W, et al. Multistate point-prevalence survey of health care-associated infections. *N Engl J Med* 2014;370:1198–1208.
3. Wang P, Zhou Y, Wang Z, et al. Identification of *Clostridium difficile* ribotype 027 for the first time in mainland China. *Infect Control Hosp Epidemiol* 2014;35:95–98.
4. Pituch H, Kreft D, Obuch-Woszczatynski P, et al. Clonal spread of a *Clostridium difficile* strain with a complete set of toxin A, toxin B, and binary toxin genes among Polish patients with *Clostridium difficile*-associated diarrhea. *J Clin Microbiol* 2005;43:472–475.
5. Carter GP, Douce GR, Govind R, et al. The anti-sigma factor TcdC modulates hypervirulence in an epidemic BI/NAP1/027 clinical isolate of *Clostridium difficile*. *PLOS Pathog* 2011;7:e1002317.
6. Goorhuis A, Bakker D, Corver J, et al. Emergence of *Clostridium difficile* infection due to a new hypervirulent strain, polymerase chain reaction ribotype 078. *Clin Infect Dis* 2008;47:1162–1170.
7. Lim SK, Stuart RL, Mackin KE, et al. Emergence of a ribotype 244 strain of *Clostridium difficile* associated with severe disease and related to the epidemic ribotype 027 strain. *Clin Infect Dis* 2014;58:1723–1730.

Methicillin-Resistant *Staphylococcus aureus*: More Attention Should Be Paid in Mainland China

To the Editor—Methicillin-resistant *Staphylococcus aureus* (MRSA) represents a major problem for public health systems with resistance to methicillin and other antibiotics with high prevalence in hospital and community settings. Remarkably, in the United States the estimated number of deaths due to MRSA infections exceeds that due to human immunodeficiency virus (HIV)/ AIDS.[1] MRSA colonization plays a key role in the epidemiology and pathogenesis of staphylococcal infections in HIV-infected patients. Recently, Zervou and colleagues[2] conducted a meta-analysis and showed that individuals with HIV infection are frequently colonized with MRSA. The overall estimated prevalence was 6.9% (95% CI, 4.8%–9.3%) and varied between geographic regions, from 1.0% in Europe to 8.8% in North America. The pooled prevalence rate was 5.8% (95% CI, 2.8%–9.8%) in the Asian HIV-infected population.[2] Information about MRSA colonization amongst HIV-infected populations may be useful for implementation of effective strategies to prevent staphylococcal infections.

The prevalence of AIDS cases in mainland China has grown steadily in the period of 2004 to 2013, with a 10-fold increase.[3] Unfortunately, the study by Zervou et al[2] did not provide prevalence data specifically about MRSA colonization rates among HIV-infected individuals in China.

Currently, strains of MRSA are the most prevalent nosocomial pathogen in China, and several reports have shown that this is an increasing trend.[4,5] One surveillance study performed in China showed that 63% of *S. aureus* isolates were MRSA, including 77% of nosocomial isolates and 43% of community isolates.[5] Dissemination of virulent MRSA clones among healthy persons in China may contribute to the presence of clinically significant MRSA infections in some locales,[6] but few studies have described the epidemiology and prevalence of MRSA colonization in healthy Chinese individuals. Most studies have been conducted in inpatients, especially in intensive care units.[7] Only 3 published studies[4,6,8] were found when we searched for the prevalence of MRSA colonization among healthy Chinese individuals using both English and Chinese databases (Table 1). We found that in mainland China the prevalence of MRSA colonization among healthy persons was higher than in other countries, including the United States[9] and European countries.[10] Such high MRSA colonization rates pose a significant challenge for MRSA prevention programs in China.

Although there is no study investigating the prevalence of MRSA colonization in Chinese HIV-infected populations thus far, it seems reasonable to speculate that the prevalence will be high. There is a clearly a critical need to characterize the epidemiology of MRSA colonization/infection more fully in mainland China so that effective prevention programs can be implemented.

ACKNOWLEDGMENTS

Financial support. The National Natural Science Foundation of China (grant 81072367); and the Key University Science Research Project of Anhui Province (grant KJ2014ZD32).

Potential conflicts of interest. All authors report no conflicts of interest relevant to this article.

Hui Peng, MS;[1]
Qiang Hu, BS;[2]
Xiu-Bin Tao, MS, RN;[1]
Ying-Shui Yao, MS[3]

Affiliations: 1. Department of Hospital Infection Management, Yijishan Hospital of Wannan Medical College, Wuhu, China; 2. Department of Science and Technology, Yijishan Hospital of Wannan Medical College, Wuhu, China; 3. Department of Epidemiology and Biostatistics, School of Public Health, Wannan Medical College, Wuhu, China. H.P. and Q.H. contributed equally to this work and should be considered as co-first authors.

Address correspondence to Ying-Shui Yao, MS, Department of Epidemiology and Biostatistics, School of Public Health, Wannan Medical College, West of Wenchang Rd, University Park, Wuhu, Anhui, 241001, China (yingshuiyao@163.com).

Infect. Control Hosp. Epidemiol. 2015;36(9):1114–1115

 0899-823X/2015/3609-0022. DOI: 10.1017/ice.2015.141

REFERENCES

1. Klevens RM, Morrison MA, Nadle J, et al. Invasive methicillin-resistant *Staphylococcus aureus* infections in the United States. *JAMA* 2007;298:1763–1771.

TABLE 1. Characteristics and Results of Studies That Investigated Methicillin-Resistant *Staphylococcus aureus* (MRSA) Colonization Among Healthy Chinese Individuals

Author	Year	Population		Screening	MRSA colonization, no. (%)
		Profession	Number		
Ma et al[8]	2011	Medical students	2,103	Nasal	22 (10.5)
Du et al[6]	2011	Medical students	935	Nasal	28 (3.0)
Qu et al[4]	2010	Military volunteers	1,044	Nasal	0 (0.0)

2. Zervou FN, Zacharioudakis IM, Ziakas PD, Rich JD, Mylonakis E. Prevalence of and risk factors for methicillin-resistant *Staphylococcus aureus* colonization in HIV infection: a meta-analysis. *Clin Infect Dis* 2014;59:1302–1311.
3. Xu Y, Yang G, Liu H, et al. Epidemiologic features of AIDS in China, 2004-2013. *Clin Infect Dis* 2015;60:167–169.
4. Qu F, Cui E, Guo T, et al. Nasal colonization of and clonal transmission of methicillin-susceptible *Staphylococcus aureus* among Chinese military volunteers. *J Clin Microbiol* 2010;48: 64–69.
5. Xiao YH, Wang J, Li Y, MOH National Antimicrobial Resistance Investigation Net. Bacterial resistance surveillance in China: a report from Mohnarin 2004-2005. *Eur J Clin Microbiol Infect Dis* 2008;27:697–708.
6. Du J, Chen C, Ding B, et al. Molecular characterization and antimicrobial susceptibility of nasal *Staphylococcus aureus* isolates from a Chinese medical college campus. *PLOS ONE* 2011;6: e27328.
7. Li Q, Zhuang T, Lin Y, Xi J, Yao G. Risk factors affecting nasal colonization of methicillin-resistant *Staphylococcus aureus* when admitted in intensive care unit. *Chin Med J (Engl)* 2014;127: 1804–1807.
8. Ma XX, Sun DD, Wang S, et al. Nasal carriage of methicillin-resistant *Staphylococcus aureus* among preclinical medical students: epidemiologic and molecular characteristics of methicillin-resistant *S. aureus* clones. *Diagn Microbiol Infect Dis* 2011;70:22–30.
9. Gorwitz RJ, Kruszon-Moran D, McAllister SK, et al. Changes in the prevalence of nasal colonization with *Staphylococcus aureus* in the United States, 2001–2004. *J Infect Dis* 2008;197: 1226–1234.
10. den Heijer CD, van Bijnen EM, Paget WJ, et al. Prevalence and resistance of commensal *Staphylococcus aureus*, including meticillin-resistant *S aureus*, in nine European countries: a cross-sectional study. *Lancet Infect Dis* 2013;13:409–4415.

Importance of Air Particle Counts in Hospital Infection Control: Insights From a Cancer Center in Eastern India

Clean rooms are classified in a variety of different ways, which include the International Organization for Standardization classification (ISO standards 14644–1; classes 1–9), Federal Standards (FED 209E) having Imperial type classification (Class 1 to 100,000), and the Metric classification (Metric 1–7).[1,2] The Imperial Class 100 room correlates with ISO 2 and the Metric 3.5 standard and is based on airborne particle counts (APCs) of 0.5 µm/ft^3. One hundred particles of 0.5 µm dimension per cubic foot by Imperial Standards equals 3,530 particles per cubic meter.[1,2] Maintaining the quality of air in critical areas such as bone marrow transplant or stem cell transplant units, clean operating rooms, and biological safety cabinets and laminar air flow hoods is essential for maintaining standards and optimizing outcomes for the patients and staff of the hospital.

In this study we describe the importance of APCs in maintaining and monitoring air quality in a cancer center in eastern India. The methodology included monitoring air quality using a handheld air particle counter (ErgoTouch Pro; Biotest [now MerckMillipore]).[3] This equipment measures airborne particles of 6 sizes (0.3 µm, 0.5 µm, 1 µm, 3 µm, 5 µm, and 10 µm) using lasers. It samples 0.1 ft^3 of air in a single sampling time of 1 minute. The results can be reviewed with the time of the exact sampling and show both differential counts (each size) and cumulative counts (of all 6 sizes). The air particle counter gives real-time data within a minute, which is not the case with air microbial sampling or settle plate methods, which need 48 hours for bacteria and 5 days for filamentous fungi for enumeration of colony counts.[4]

In a biological safety cabinet that is working optimally, APCs of all 6 sizes (0.3 µm to 10 µm) should be zero/ft^3—both differential and cumulative.

In a high efficiency particulate air (HEPA)–filtered Class 100 operating room, during nonoperating hours, with a functional air-handling unit and optimal sufficient air changes per hour, the APCs of 0.5 µm particles are ideally less than 100 per ft^3. The Report of the Joint Working Party on Ventilation in Operating Suites advised that all operating theaters should ideally have a ventilation equivalent of 20 air changes per hour.[5] Air changes per hour are calculated by dividing air supply rate by room volume.

Each set of readings performed on a particular day also details the minimum, average, and maximum reading for each channel, along with the standard deviation and standard error of these findings. For example, on a given day in February 2015 in the 8 operating rooms of this center, the 0.5 µm counts

https://doi.org/10.1017/ice.2015.141 Published online by Cambridge University Press