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Increase in Chlorhexidine Minimal Inhibitory Concentration of *Acinetobacter baumannii* Clinical Isolates after Implementation of Advanced Source Control

To the Editor—Advanced source control is a strategy to decrease the burden of skin colonization and/or oral cavity carriage of multidrug-resistant pathogens.[1,2] One example of this approach is the use of chlorhexidine bathing with or without oral care to potentially reduce patients' risk of infection associated with healthcare worker hand contamination during healthcare encounters.[1,3,4] To date, the associations of chlorhexidine use and the emergence of chlorhexidine-resistant gram-negative bacteria remain limited.[5-7] We report the associations of combined chlorhexidine baths and oral care associated with the emergence of chlorhexidine with increased in the minimum inhibitory concentration (MIC) of *Acinetobacter baumannii* isolates at a Thai hospital.

Thammasat University Hospital is a 650-bed university hospital located in central Thailand. Hospital units implemented an advanced source control strategy on May 1, 2011, in response to the increased incidence of extensively drug-resistant (XDR) *A. baumannii*, defined as isolates resistant to all available systemic antibiotics except polymyxin B or tigecycline.[8] Fifty consecutive clinical XDR *A. baumannii* isolates obtained during the prechlorhexidine period (October 1, 2010–April 30, 2011) were compared for the MIC 50/90 to 50 consecutive XDR *A. baumannii* isolates during the postchlorhexidine period (May 1, 2011–April 30, 2012). Bacterial isolates were tested by the standard microbroth dilution method recommended by the Clinical Laboratory Standards Institute.[9] Briefly, 100 μL of an overnight bacterial suspension, adjusted to 10^6 colony forming units/mL + 100 μL of the chlorhexidine dilution (1–128 μg/mL), were mixed in a 96-well plate and incubated at 35°C. The MIC was defined as the lowest concentration that inhibited visible growth after 24 hours. Data collection included specimen source, hospital unit, chlorhexidine consumption (liter/unit/month), chlorhexidine MICs 50/90 for *A. baumannii*, and incidence of XDR *A. baumannii*. Pearson correlation was used to correlate the monthly consumption of chlorhexidine, the change in chlorhexidine MIC, and the prevalence of XDR *A. baumannii*.

In a comparison of the *A. baumannii* MIC 50/90 during the pre- and postchlorhexidine advanced source control periods, the most common specimens were sputum (70/100; 70%) and blood cultures (11/100; 11%). Most clinical specimens were submitted from intensive care units (70/100; 70%) and medical units (15/100; 15%). There was an overall increase in chlorhexidine consumption and *A. baumannii* chlorhexidine MIC 50/90 among all hospital units and all infection sites after implementing advanced source control (Table 1). Although there was a correlation between chlorhexidine consumption and *A. baumannii* chlorhexidine MIC ($r = 0.69$, $P = .01$), the incidence of XDR *A. baumannii* did not increase across hospital units or specimen sources (Table1).

The mechanism of chlorhexidine resistance in *A. baumannii* is purportedly associated with bacterial efflux pumps.[10] In this study, although the magnitude of chlorhexidine exposure resulting in the increase in *A. baumannii* chlorhexidine MICs 50/90 during the 12-month advanced source control period, it did not achieve the threshold for the emergence of chlorhexidine-resistant XDR *A. baumannii* detection, yet our data suggest that ongoing active surveillance for chlorhexidine-resistant *A. baumannii* as well as its MIC 50/90 is needed to evaluate the emergence of chlorhexidine-resistant *A. baumannii*.

ACKNOWLEDGMENTS

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

TABLE 1. Comparison of the Epidemiology of Chlorhexidine Minimum Inhibitory Concentrations (MICs) among Extensively Drug-Resistant (XDR) *Acinetobacter baumannii* Clinical Isolates before and after Implementation of Advanced Source Control

		Prechlorhexidine (n = 50)			Postchlorhexidine (n = 50)		
Hospital unit	n	Chlorhexidine consumption (L/unit/month)	Chlorhexidine MIC 50/90	Incidence of XDR *A. baumannii* per 1,000 patient-days	Chlorhexidine consumption (L/unit/month)	Chlorhexidine MIC 50/90	Incidence of XDR *A. baumannii* per 1,000 patient-days
Intensive care	70	2.4	32/32	12.5	15.5	64/128	2.9
General medicine	15	0.9	32/32	11.4	9.8	64/128	6.3
General surgical	10	0.5	16/32	9.6	4.5	64/128	4.6
Other[a]	5	0.1	16/32	1.2	2.5	64/128	0.6

NOTE. Prechlorhexidine period: October 1, 2010–April 30, 2011. Postchlorhexidine period: May 1, 2011–April 30, 2012. Clinical specimens were obtained from sputum culture (n = 70), blood culture (n = 11), urine culture (n = 9), wound/pus culture (n = 8), and intra-abdominal culture (n = 2)

[a] Includes orthopedic, obstetrics, and gynecology units.

Potential conflicts of interest. L.M.M. reports that she is an employee of GlaxoSmithKline and that her contributions were pro bono and independent of GlaxoSmithKline. All other 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(1):98-99

 0899-823X/2014/3501-0021$15.00. DOI: 10.1086/674404

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What Is the Source of Bloodstream Infection due to Vancomycin-Resistant Enterococci in Persons with Mucosal Barrier Injury?

To the Editor—Persons undergoing treatment with cytotoxic chemotherapy or hematopoietic stem cell transplant (HSCT) are particularly vulnerable to bloodstream infections (BSIs). While performing surveillance for central line–associated BSIs (CLABSIs), many infections that result from gut translocation following mucosal injury are likely to be misinterpreted as catheter associated. These infections would not be amenable to CLABSI preventive efforts and can adversely affect publicly reported rates.[1,2]

While definite diagnosis of CLABSI requires catheter removal, an alternate method of differential time to positivity (DTP) has proved to have good sensitivity and specificity in diagnosis of CLABSI.[3] Colonization with vancomycin-resistant enterococci (VRE) is increasingly being encountered