

Screening for Carbapenem-Resistant *Acinetobacter baumannii* Colonization Sites: An Implication for Combination of Horizontal and Vertical Approaches

TO THE EDITOR—Active surveillance cultures for multidrug-resistant gram-negative bacteria, including carbapenem-resistant (CR) *Acinetobacter baumannii*, has been suggested by several authorities as a strategy to control outbreaks of multidrug-resistant gram-negative bacteria among at-risk populations, including patients in intensive care, burn, stem cell transplant, and oncology units; patients transferred from facilities known to have high prevalence rates; roommates of colonized or infected persons; and patients known to have been previously infected or colonized [1, 2]. Despite these recommendations, standardized screening schemes and understanding of which body sites are most commonly colonized by these pathogens are lacking. Knowing which anatomic locations are most commonly colonized by CR *A. baumannii* is important to inform appropriate infection prevention interventions and cost-effective screening policies.

We performed a prospective cohort study in a medical intensive care unit (ICU) at Thammasat University Hospital, a 650-bed hospital in central Thailand. From 1 January 2007 to 31 October 2012, all consecutive adult patients in whom CR *A. baumannii* was detected in 1 or more routine clinical cultures were included in this study. Study patients were then screened for colonization; urine (via urinary catheter), tracheal aspirate, rectal, and sternal skin cultures were obtained. Patients who did not undergo screening of all 4 body sites or who were receiving antibiotics active against CR *A. baumannii* were excluded. Specimens were transported and processed within 1 hour of procurement for culture on MacConkey agar plates. Bacterial colonies suspected

of being *A. baumannii* were identified using standard microbiological techniques [3], and antibiotic susceptibility results were interpreted according to Clinical and Laboratory Standards Institute breakpoints [4]. This study was approved by the Thammasat University Institutional Review Board.

During the study period, 129 of 160 patients (80%) had all 4 body sites cultured for CR *A. baumannii*; 31 patients were excluded because they were discharged from our hospital prior to testing or were receiving antibiotics with activity against CR *A. baumannii*. The median age was 64 years (range, 26–78 years) and 65% (84/129) were male. Carbapenem-resistant

A. baumannii was isolated from at least 1 body site in 108 (85%) patients with a history of a positive clinical culture. CR *A. baumannii* was most commonly recovered from tracheal aspirates (103 [80%]), followed by rectal specimens (89 [69%]), sternal skin swabs (67 [52%]), and urine (32 [25%]). Notably, 59 (46%) patients had >1 positive body site. Performing both a rectal and tracheal aspirate culture had the highest yield of any combination of 2 body sites (97 [75%]). An overview of the pattern of colonization in the 129 patients is summarized in Table 1.

Limitations of our study include an observational design, being conducted at a single center, no cultures of noninfect

skin, and relatively small sample size. Despite these limitations, our study has some important implications. We found that a combination of tracheal aspirate and rectum specimens identified 75% of patients with a history of CR *A. baumannii*, suggesting the role of these 2 sites as screening sites to detect CR *A. baumannii* in this patient population. Several authors have commented on having horizontal and vertical components to infection prevention programs. Horizontal control was defined as an approach in which all organisms in any site were targeted, while vertical control was defined as an approach in which only specific organisms were targeted [5, 6]. Given that CR *A. baumannii* was detected in various sites among ICU patients, our findings support the role of a “horizontal” infection control approach (eg, hand hygiene, contact isolation) together with a “vertical” infection control approach (eg, use of chlorhexidine mouth care) to control the spread of CR *A. baumannii* in this patient population [5, 6]. Additional studies to assess the incremental value of vertical infection control approach on top of horizontal infection control approach should be the key questions to control CR *A. baumannii* in ICU populations.

Notes

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Table 1. Colonization Patterns of Carbapenem-Resistant *Acinetobacter baumannii* Among 129 Intensive Care Unit Patients

Colonization Site	No. (%) of Patients
One site	
Tracheal aspirate	35 (27)
Rectum	24 (19)
Sternal skin	7 (5)
Urine	4 (3)
Two sites	
Tracheal aspirate, rectum	38 (29)
Tracheal aspirate, sternal skin	7 (5)
Tracheal aspirate, urine	2 (1)
Rectum, sternal skin	11 (8)
Rectum, urine	11 (8)
Sternum, urine	2 (1)
Three sites	
Tracheal aspirate, rectum, sternal skin	20 (15)
Tracheal aspirate, rectum, urine	8 (6)
Tracheal aspirate, sternal skin, urine	3 (2)
Rectum, sternal skin, urine	6 (4)
Four sites	
Tracheal aspirate, rectum, sternal skin, urine	10 (8)
Total sites	
Colonization of the tracheal aspirate	103 (80)
Colonization at rectum	89 (69)
Colonization at sternal skin	67 (52)
Colonization at urine	32 (25)
Detection of CR <i>A. baumannii</i> at 1 sites (any site)	70 (54)
Detection of CR <i>A. baumannii</i> at tracheal aspirate and rectum	97 (75)
Detection of CR <i>A. baumannii</i> at tracheal aspirate, rectum, sternal skin	104 (80)
Detection of CR <i>A. baumannii</i> at tracheal aspirate, rectum, sternal skin, urine	108 (85)

Because a patient may have >1 colonization site, the total percentage is >100%.

Abbreviation: CR, carbapenem-resistant.

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