Is Central Venous Catheter Tips’ Colonization with Multidrug-Resistant Acinetobacter baumannii a Predictor for Bacteremia?

To the Editor—Multidrug-resistant (MDR) Acinetobacter baumannii has emerged as a potential threat to the management and control of healthcare-associated infections in several parts of the world [1]. Although bloodstream infection caused by this pathogen has been shown to be associated with increases in mortality [2–3], it remains unclear whether central venous catheter colonization by this microorganism, with negative concurrent blood culture results, will lead to the subsequent development of bacteremic complications. A previous study reported that patients with intravascular catheter colonization with Staphylococcus aureus but without concomitant bacteremia had a 24% chance of subsequent S. aureus bacteremia if they did not receive immediate antistaphylococcal antibiotics [4]. Evidence to guide the appropriate management of A. baumannii catheter colonization is lacking and has been suggested by the Infectious Diseases Society of America as an area for future study [5]. We performed a prospective study to assess the
incidence of bacteremic complications in patients with central venous catheter tips colonized by MDR *A. baumannii* who did not have concomitant bacteremia.

Patients with MDR *A. baumannii* cultured from central venous catheter tips during the period of 1 January 2004 through 30 June 2010 were identified from both Infection Control and Microbiology computer databases at Thammasat University Hospital and prospectively observed. In all patients, blood cultures had been performed during the 48 h before and after catheter removal. Patients with blood cultures positive for MDR *A. baumannii* during the period from 48 h before through 48 h after catheter removal and patients for whom >1 organism was isolated from blood cultures were excluded from analysis. Demographic and clinical characteristics of study patients were abstracted from the medical records, and all patients were observed for bacteremic complications for a 6-month period after catheter removal. In this study, MDR *A. baumannii* was defined as an isolate that was resistant to >3 classes of the following antibiotics: cephalosporins, \( \beta \)-lactam/\( \beta \)-lactamases inhibitors, aminoglycosides, fluoroquinolones, and carbapenems. Bacteremic complication was defined as a blood culture result positive for *A. baumannii* obtained >48 h after removal of a catheter, with an antibiotic susceptibility pattern identical to that of the catheter isolate. Treatment of *A. baumannii* colonization was defined as receipt of \( \geq 3 \) days of parenteral antimicrobial therapy to which the isolated strain was susceptible. Catheter tip cultures were processed as described elsewhere and considered to have positive results when the culture yielded \( \geq 15 \) colony-forming units [6].

During the study period, 141 patients had catheter tips positive for MDR *A. baumannii*, 80 (57%) of whom had no evidence of MDR *A. baumannii* bacteremia during the 48 h before and after catheter removal. Among these 80 patients, 41 (51%) received treatment, while 39 (49%) received no therapy. There were no differences in demographic and clinical characteristics among these 2 groups. The median duration of catheterization between the groups was comparable (13 vs 12 days; \( P = .79 \)). Notably, 21 (54%) of 39 patients who received no therapy, compared with 2 (5%) of 40 patients who received therapy (relative risk, 22.54 [95% confidence interval (CI), 2.7–42.8]; \( P < .001 \)), subsequently developed MDR *A. baumannii* bacteremia (Figure 1). Bacteremia occurred a median of 10 days after central venous catheter removal (range, 3–30 days). Bacteremic complications and mortality outcome among the 2 groups are shown in Figure 1.

To our knowledge, this is the first study to suggest that central venous catheter colonization with MDR *A. baumannii* was associated with a 28% (95% CI, 19%–40%) incidence of subsequent bacteremia, which was more frequent among the group of patients who did not receive antibiotics within 48 h after catheter removal. Antibiotic treatments were associated with 91% lower risk of subsequent bacteremia, which supports the role of antibiotic treatment to prevent subsequent bacteremic episodes among these patients. Given the limited sample size.

![Figure 1](https://academic.oup.com/cid/article-abstract/52/10/1080/287244)

**Figure 1.** Bacteremic outcome of central venous catheter tip colonization with multidrug-resistant *Acinetobacter baumannii*. AB, *A. baumannii*; ABB, *A. baumannii* bacteremia; CVC, central venous catheter.
size and the inability to type for MDR A. baumannii strain, additional studies are needed to identify risk factors for subsequent bacteremic episodes and to establish the optimal duration of treatment.

Acknowledgments

Financial support. This work was supported by the Infectious Diseases and Infection Control Research Unit at Thammasat University Hospital.

Potential conflicts of interest. V.J.F. is a consultant for Hawaii Chitopure and Ancora; has received grant funding from NIH, CDC, and AHRO; and is a stock holder in Express Scripts. D.K.W. is a consultant for C.R. Bard. All other authors: no conflicts.

Anucha Apisarnthanarak,1 Piyaporn Apisarnthanarak,2 David K. Warren,3 and Victoria J. Fraser3

1Division of Infectious Diseases, Thammasat University Hospital, Pratumthani, and 2Department of Radiology, Siriraj Hospital, Mahidol University, Bangkok, Thailand, and 3Division of Infectious Diseases, Washington University School of Medicine, Saint Louis, Missouri

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