Risk factors for mortality in *Acinetobacter* bacteremia

Dear Editor,

Acinetobacter (AB) species are non-fermenting aerobic Gram-negative bacteria that have emerged as important nosocomial pathogens[1] and multidrug resistant (MDR) *Acinetobacter* strains have increased rapidly.[2] Moreover *Acinetobacter* bacteremia (AB) is associated with high mortality rates that vary from 17-52%. Although studies have been performed to reveal risk factors that affect MDR or pandrug-resistant (PDR) strains,[3] the risk factor of mortality of patients with AB is yet unclear. With this in mind, the present study was undertaken to identify the risk factors associated with the mortality of AB patients.

A retrospective cohort study identifying risk factors for mortality in patients with AB between January 2007 and October 2009 was performed at the Eulji Medical Center, a 1053-bed tertiary hospital in Daejeon, South Korea. Demographic, clinical, and laboratory variables were collected. For statistical analyses the SPSS software was used [95% confidence interval (CI), significant p-value < 0.05].

Fifty-three adult patients (30 males, 23 females) with AB were included. The mean age of all patients was 63 years. *Acinetobacter baumannii* complex was the most common isolate (76%), followed by *Acinetobacter lwoffii* (21%), and *Acinetobacter junii* (4%). The antibiograms showed all-sensitive susceptibility in 19% of the isolates, carbapenem resistance in 28%, MDR in 60%, and PDR in 8%. Fourteen patients (26.4%) received appropriate use of antibiotics. Unknown site of bacteremia (69.8%) was the most frequent source of infection, followed by lung (28.3%), urinary tract (3.8%), wound (3.8%), and biliary tract (1.9%). The most common procedure before the onset of AB was central venous catheterization (52.8%) and surgical drainage (52.8%), followed by mechanical ventilation (50.9%), and hemodialysis (5.7%). Mean duration of hospital stay before the onset of bacteremia was 15 days. Twenty-one of the 53 (40%) patients were in the ICU at the time of AB onset, and the mean duration of ICU stay before the onset of bacteremia was eight days. *Diabetes mellitus* (24.5%) was the most common underlying disease, followed by chronic renal failure (17.0%), chronic obstructive pulmonary disease (11.3%), congestive heart failure (CHF) (11.3%), and chronic liver disease (7.5%). Compared with the AB patients who survived, those who died had more *A. baumannii* complex and *A. Iwoffii* as the infecting species, increased use of mechanical ventilation, prior use of central venous catheterization, longer duration of hospital and ICU stay before bacteremia onset, CHF as underlying disease, infusion of total parenteral nutrition and septic shock. Statistically significant association was found only with longer duration of hospital stay before bacteremia onset in a multivariate logistic regression model (odds ratio, 1.069; 95% CI, 1.002–1.140; p = 0.042).

The mortality rate of AB in this study was 26.4% (14 cases), which is comparable to other studies (17-52%).[4] A recent retrospective study showed that patients with MDR *A. baumannii* bacteremia had a higher mortality rate and longer hospital stays compared to those with non-MDR AB.[5] Our study revealed that a longer duration of hospital stay before bacteremia onset is the risk factor that leads to increased mortality. Although a retrospective study lowers the reliability of the conclusion that part of the mortality was directly attributable to longer duration of hospital stay, the impact of these issue is undeniable. At present, the rate of development of new drugs against

Authors
Seongeun Yang[1]
Hee Jung Yoon[2]
Mo Ran Ki[2]

[1]MD, Division of Infectious Diseases, Department of Internal Medicine, Eulji University College of Medicine, Daejeon, Korea
[2]MD, PhD; Professors, Division of Infectious Diseases, Department of Internal Medicine, Eulji University College of Medicine, Daejeon, Korea

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Correspondence to:
Seongeun Yang
Department of Internal Medicine,
Eulji University School of Medicine, Daejeon, Korea
1306 Dunsandong, Seogu
Daejeon, Korea (302-799)
yangse@eulji.ac.kr

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Table 1. Multivariate analysis of risk factors for mortality in* Acinetobacter *bacteremia

	p-value	Odds ratio	95% CI
Mechanical ventilation	0.908	0.856	0.060-12.173
Central venous catheterization	0.885	0.844	0.085-8.344
Duration of hospital stay before bacteremia onset	0.042	1.069	1.002-1.140
ICU stay at time of bacteremia onset (%)	0.076	9.435	0.792-112.447
MDR/PDR	0.583	0.546	0.063-4.729

ICU, intensive care unit; MDR, multidrug resistance; PDR, pandrug resistance.

MDR/PDR bacteria under-paces the rate of resistance development. So, preventive measures, such as diminishing the duration of hospital stay to avoid harmful bacteria are essential. Further studies are needed to address the prevention and the appropriate use of antimicrobial agents in AB patients.

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