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■ CORRESPONDENCE ■

To the editor:

Community-acquired versus Nosocomial *Klebsiella pneumonia* Bacteremia: Clinical Features, Treatment Outcomes, and Clinical Implication of Antimicrobial Resistance

Klebsiella species are clinically important gram-negative germs, because of (i) their tendency to develop antibiotic resistance and (ii) their association with fatal outcome (1). Early initiation of an adequate antibiotic regimen has been shown to improve an individuals' prognosis (2). Therefore, it is crucial to identify these risk factors associated with worse outcome as soon as possible aiming to lose no time to appropriate management (3-5). In the October issue of the *Journal* we read with major interest the article by Kang and colleagues studying clinical features, treatment outcomes, and clinical outcomes in patients with *K. pneumoniae*. A total of 377 patients with *K. pneumoniae* bacteremia, of which 191 were defined as community-acquired and 186 as nosocomial, were analyzed (6). This study found mortality rates due to nosocomial infection to be more than twice as high as the mortality rates due to community-acquired infection (6). Next, a multitude of risk factors were found to be independently associated with 30-day mortality (6).

First, we would like to congratulate the authors for their considerable efforts made in gathering one of the largest databases of both community-acquired and nosocomial *K. pneumonia* bacteremia.

Second, while this study adds substantial support to earlier reports, one specific concern was raised. Strongly significant differences were observed in terms of demographic characteristics and underlying conditions of patients between the two study groups. The group with nosocomial infection was sicker, had more prior antibiotic exposure, received inappropriate antibiotics (both empiric and definitive therapy) more often, showed antibiotic resistance more frequently, and underwent more invasive procedures compared to the group with community-acquired infection. This may have biased the results. In a study concerning clinical outcomes in patients with Methicillin-Susceptible (MSSA) versus Methicillin-Resistant *Staphylococcus aureus* (MRSA), Soriano and colleagues compared 225 episodes of MSSA bacteremia with 683 episodes of MRSA bacteremia (7). In this cohort, the latter was also more severely ill and thus had, higher intrinsic mortality rate (6, 7). Therefore, Soriano et al. composed 163 matched pairs of MSSA and MRSA bacteremia based on pre-existing comorbidities, prognosis of underlying diseases, and length of stay prior to onset of bacteremia. Nevertheless, there were still more comorbidity factors and a higher rate of shock and related mortality noted in the MRSA group. After performing logistic regression analysis, methicillin resistance was no longer independently associated with shock and mortality (7). Based on this finding, the authors concluded that cohort studies tend to magnify the relationship of MRSA with clinical markers of microbial pathogenicity by inadequately controlling for underlying conditions (7). According to the study by Kang and colleagues, it can be presumed that the authors potentially have overestimated the pathogenic impact of nosocomial *K. pneumonia* bacteremia (8). To overcome this difficulty, a matched cohort study design can provide a satisfying alternative (9). Doing so, and by sophisticated adjustment for the severity of illness, risk factors directly attributable to either community-acquired or nosocomial *K. pneumoniae* bacteremia could be identified.

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