

comycin-resistant and susceptible enterococcal bacteremia. *Diagn Microbiol Infect Dis* 2000; 36:145-158.

- Zaas AK, Song X, Tucker P, Perl TM. Risk factors for development of vancomycin-resistant enterococcal bloodstream infection in patients with cancer who are colonized with vancomycin-resistant enterococci. *Clin Infect Dis* 2002; 35:1139-1146.
- Roghmann MC, Fink JC, Polish L, et al. Colonization with vancomycin-resistant enterococci in chronic hemodialysis patients. *Am J Kidney Dis* 1998; 32:254-257.
- Tenover FC, Arbeit RD, Goering RV, et al. Interpreting chromosomal DNA restriction patterns produced by pulse-field gel electrophoresis: criteria for bacteria strain typing. *J Clin Microbiol* 1995; 33:2233-2239.
- Matushek MG, Bonten MJ, Hayden MK. Rapid preparation of bacterial DNA for pulsed-field gel electrophoresis. *J Clin Microbiol* 1996; 34:2598-2600.
- Dhawan VK, Nachum R, Bhat N, Tolbert L, Agrawal M. Vancomycin-resistant enterococcal colonization in nonhospitalized HIV-infected patients. *West J Med* 1998; 169:276-279.
- McDonald LC, Lauderdale TL, Lo HL, Tsai JJ, Hung CC. Colonization of HIV-infected outpatients in Taiwan with methicillin-resistant and methicillin-susceptible *Staphylococcus aureus*. *Int J STD AIDS* 2003; 14:473-477.
- Villacian JS, Barkham T, Earnest A, Paton NI. Prevalence of and risk factors for nasal colonization with *Staphylococcus aureus* among human immunodeficiency virus-positive outpatients in Singapore. *Infect Control Hosp Epidemiol* 2004; 25:438-440.
- Hagen EA, Lautenbach E, Olthoff K, Blumberg EA. Low prevalence of colonization with vancomycin-resistant enterococcus in patients awaiting liver transplantation. *Am J Transplant* 2003; 3:902-905.
- Puzniak LA, Gillespie KN, Leet T, Kollef M, Mundy LM. A cost-benefit analysis of gown use in controlling vancomycin-resistant *Enterococcus* transmission: is it worth the price? *Infect Control Hosp Epidemiol* 2004; 25:418-424.

## Colonization by Antibiotic-Resistant Gram-Negative Bacteria and Appropriate Empirical Antibiotic Therapy in Intensive Care Unit Patients

TO THE EDITOR—The June 2005 issue of the journal included an article by Blot et al.<sup>1</sup> that described the potential relationship between prior colonization and appropriate empirical antibiotic therapy for infection with some antibiotic-resistant gram-negative bacteria in intensive care unit (ICU) patients. The authors defined prior colonization as “the presence (detected 2 or more days before the onset of bacteremia and during the ICU stay) of the same antibiotic-resistant gram-negative bacteria in colonization and subsequent blood cultures.”<sup>1(p576)</sup>

In light of this definition, we understand that patients who had been previously colonized by an antibiotic-resistant gram-negative bacterium and subsequently had bacteremia caused by a different antibiotic-resistant gram-negative bacterium may have been included in the group without prior colonization by any antibiotic-resistant gram-negative microorganism. If this is the case, then the analysis of the impact

that colonization status had on the rate of appropriate initial antibiotic therapy is not accurate.

On the same page, Blot et al.<sup>1(p576)</sup> defined antibiotic therapy as appropriate when it included “an in vitro effective antibiotic.” It is known that some gram-negative bacteria—such as *Klebsiella* species, *Escherichia coli*, and many others—may be producers of extended-spectrum  $\beta$ -lactamases<sup>2-6</sup> and that this may lead to false-positive findings of in vitro susceptibility to some  $\beta$ -lactams, including cefuroxime or cefepime, both of which were used for empirical antibiotic therapy at the study institution. Therefore, it is possible that some of the patients who had bacteremia caused by any such bacteria may have been improperly classified as having received appropriate initial empirical antibiotic therapy, because of false-positive findings of in vitro susceptibility to a  $\beta$ -lactam eventually prescribed. Again, if this is the case, then the analysis of the impact that colonization status had on the rate of appropriate initial antibiotic therapy is not accurate.

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## REFERENCES

- Blot S, Depuydt P, Vogelaers D, et al. Colonization status and appropriate antibiotic therapy for nosocomial bacteremia caused by antibiotic-resistant gram-negative bacteria in an intensive care unit. *Infect Control Hosp Epidemiol* 2005; 26:575-579.
- Archibald LK. Gram-negative, hospital-acquired infections: a growing problem. *Infect Control Hosp Epidemiol* 2004; 25:809-811.
- Knothe H, Shah P, Kremery V, Antal M, Mitsuhashi S. Transferable resistance to cefotaxime, cefoxitin, cefamandole and cefuroxime in clinical isolates of *Klebsiella pneumoniae* and *Serratia marcescens*. *Infection* 1983; 11:315-317.
- Chanawong A, M'Zali FH, Heritage J, Lulitanond A, Hawkey PM. SHV-12, SHV-5, SHV-2a and VEB-1 extended-spectrum  $\beta$ -lactamases in Gram-negative bacteria isolated in a university hospital in Thailand. *J Antimicrob Chemother* 2001; 48:839-852.
- Quinteros M, Radice M, Gardella N, et al. Extended-spectrum  $\beta$ -lactamases in *Enterobacteriaceae* in Buenos Aires, Argentina, public hospitals. *Antimicrob Agents Chemother* 2003; 47:2864-2867.
- Poirel L, Menuteau O, Agoli N, Cattoen C, Nordmann P. Outbreak of extended-spectrum  $\beta$ -lactamase VEB-1-producing isolates of *Acinetobacter baumannii* in a French hospital. *J Clin Microbiol* 2003; 41:3542-3547.