Resistant Gram-Negative Infection May Worsen Patient Outcomes

In univariate analysis, the patients with multidrug-resistant Acinetobacter had a significantly higher rate of mortality (27.1%) compared with both the susceptible Acinetobacter group (16.7%) and the no Acinetobacter group (12.4%). In addition, the mean length of hospital stay was significantly higher in the multidrug resistant group (27 days) compared with the other two groups (20 and 19 days, respectively).

To assess the independent impact of resistance, the researchers used a multivariate analysis to control for the effect of severity of illness. Patients with multidrug-resistant Acinetobacter were twice as likely as were the controls to have a longer-than-average hospital stay and were 2-3 times more likely to have a longer-than-average ICU stay. But the multivariate model showed no significant difference in mortality among the groups. The findings emphasize that drug resistance cannot overcome the impact of severity on mortality, although resistance was associated with a longer hospital stay.

Assessment of the role of illness severity continues to challenge researchers in outcome studies of drug resistance, Dr. Srinivasan said.

“The nature of the epidemiology of resistant gram-negative pathogens is a dynamic one. It’s not steady, and it is going to continue to evolve,” Dr. Srinivasan commented. “The resistant pathogens are becoming a bigger and bigger problem, and our therapeutic options are not keeping pace.”

Five risk factors for infection or colonization with gram-negative organisms have surfaced frequently in studies: severity of illness, prolonged mechanical ventilation, prior antimicrobial exposures, prolonged hospital or ICU stay, and exposure to in-vasive medical devices.

Klebsiella pneumoniae carbapenemases, or KPCs, are perhaps the next big thing in gram-negative resistance. They cleave carbapenems, effectively conferring moderate to high levels of drug resistance to all drugs in the carbapenem class.

Carbapenems Fail to Foil Klebsiella and E. coli

Bethesda, MD. — Patients infected with extended-spectrum (ESBL)-producing organisms did not have significantly lower mortality if treated with a carbapenem antibiotic, compared with un-treated patients (25.8% vs. 26.1%), reported Jeremias L. Murillo, M.D., at an annual conference on antimicrobial resistance sponsored by the National Foundation for Infectious Diseases.

The retrospective study included 91 patients. They ranged in age from 13 to 99 years, with a mean age of 66 years. 45 patients were males and 46 were females.

Extended-spectrum β-lactamase (ESBL)-producing organisms are increasingly recognized as health care–associated pathogens, on par with vancomycin-resistant enterococci (VRE) and methicillin-resistant Staphylococcus aureus (MRSA), said Dr. Murillo of the infection control department at the Newark (N.J.) Beth Israel Medical Center.

The objective of this study was to determine whether there were differences in mortality rate and length of hospital stay between patients who were treated with a carbapenem and those who were not, and whether mortality and length of stay differed among patients infected with different organisms, he said.

E. coli, the most common cause of infection, was found in 45 patients, while Klebsiella pneumoniae infection occurred in 40 patients, and Klebsiella oxytoca was found in 6 patients.

The mortality rates for patients infected with these three organisms were 20.0%, 22.5%, and 16.6%, respectively.

Patients infected with Klebsiella pneumoniae spent significantly more time in the hospital, compared with the overall average length of stay for infected patients (79 days vs. 54 days).

Eight of 31 patients (25.8%) who received a carbapenem and 11 of 42 patients (26.1%) who did not receive a carbapenem died.

Acute Physiology and Chronic Health Evaluation (APACHE II) scores proved to be an accurate predictor of mortality; patients who died had significantly worse APACHE II scores at the time of positive culture, compared with patients who survived.

This review was prompted by two observations. The first was the introduction of ESBL-producing organisms into our institution—a 600 bed inner-city tertiary care center—in 2002, and the second observation is the fact that there were some patients infected with ESBL-producing organisms who did fairly well in the absence of carbapenem treatment,” Dr. Murillo explained.

Nalidixic Acid Resistance Rises In Salmonella enteritidis Isolates

Bethesda, MD. — The percentage of nalidixic acid–resistant Salmonella enteritidis isolates has risen significantly, from 1% to 3%, between 1996 and 2003, Felicita Medal-la, M.D., said at an annual conference on antimicrobial resistance sponsored by the National Foundation for Infectious Diseases.

Participating state health departments have submitted Salmonella isolates to the National Antimicrobial Resistance Monitoring System (NARMS) since 1996. Between 1996 and 2003, 2,349 Salmonella enteritidis isolates were tested, and 64 (3%) were resistant to the antimicrobial agent nalidixic acid, noted Dr. Medalla, a member of the NARMS working group at the Centers for Disease Control and Prevention in Atlanta.

Salmonella enteritidis was the second most common serotype reported in laboratory-confirmed cases in 2003, Dr. Medall-la reported.

Most Salmonella infections stem from the consumption of eggs, chicken, and egg-containing foods. The illness causes symp-toms similar to gastroenteritis and usually does not require treatment. However, when treatment is needed, resistance is a concern.

Resistance to nalidixic acid in any non-typhi Salmonella increased significantly during the study, from 5 of 342 isolates in 1996 (0.4%) to 47 of 1,873 isolates in 2003 (3%).

Whether the nalidixic acid-resistant Salmonella infections were acquired in the hospital setting or domestic foods is not known, said Dr. Medalla, but clinical monitoring of resistance is important, given the public health implications.

Vancomycin-Resistant Enterococci Are at Large Outside Hospital Setting, With Numbers Rising

Bethesda, MD. — The presence of vancomycin-resistant enterococci in 29 (1.4%) of 2,061 stool samples collected from healthy volunteers does not require treatment. However, when treatment is needed, resistance is a concern.

Quinolones have been the mainstay treat-ment, and nalidixic acid resistance in Salmonella has been associated with decreased susceptibility to quinolones such as ciprofloxacin in previous studies. Overall, 88% of the nalidixic acid-resistant enteritidis isolates from the 1996-2003 NARMS data sets showed decreased susceptibility to ciprofloxacin.

Resistance to nalidixic acid in any non-typhi Salmonella increased significantly during the study, from 5 of 342 isolates in 1996 (0.4%) to 47 of 1,873 isolates in 2003 (3%).

Whether the nalidixic acid-resistant Salmonella infections were acquired in the hospital setting or domestic foods is not known, said Dr. Medalla, but clinical monitoring of resistance is important, given the public health implications.