Gene Predicts MRSA-Related Pulmonary Complications

BY MICHELE G. SULLIVAN
Mid-Atlantic Bureau

Children with methicillin-resistant Staphylococcus aureus infections are more likely to show abnormal pulmonary imaging than those with methicillin-susceptible S. aureus infections.

The presence of genes encoding for Panton-Valentine leukocidin (PVL), which is much more common in methicillin-resistant S. aureus (MRSA), make it a factor in MRSA-associated pulmonary complications, said Blanca Gonzalez, M.D., and her colleagues.

The gene has been associated with severe necrotizing pneumonia and osteomyelitis, said Dr. Gonzalez of the Texas Children’s Hospital, Houston, and her associates (Clin. Infect. Dis. 2005;41:583-90).

The investigators examined pulmonary complications in 70 pediatric patients with MRSA and 43 with methicillin-susceptible S. aureus (MSSA). Pulmonary complications were much more common in the MRSA group than the MSSA group (67% vs. 28%). Two patients with MRSA died, as did one with MSSA.

Of the 47 MRSA patients with abnormal pulmonary imaging, 21 (45%) received a primary diagnosis of pneumonia. Four of these had bacteremia; 14 had empyema; 3 had uncomplicated pneumonia with bacteremia; and 4 had lung abscess. A total of 20 patients (43%) received a primary diagnosis of osteomyelitis; most (83%) had bacteremia. Imaging showed atelectasis in four; eight had pneumonia (three with effusions); and four had pneumatoceles.

Six patients had septic emboli, and the rest had multifocal air space disease or interstitial disease.

Patients with a primary diagnosis of pneumonia were significantly younger than those with other invasive MRSA disease (3.5 years vs. 10 years). Again, patients with MSSA who had a primary diagnosis of pneumonia also were significantly younger than those with other invasive disease (7 months vs. 12 years). Only 10 patients with MSSA had pulmonary complications: 2 had a primary diagnosis of pneumonia and also had loculated empyema; 6 had bone or joint infections; and 2 had endocarditis.

Isolates from 103 children were tested for genes encoding for PVL. All but one of the MRSA isolates was positive for PVL, compared with only 2 (26%) of the MSSA isolates. Among the 80 PVL-positive isolates, 51 came from children with abnormal chest radiographs, compared with 2 of 23 PVL-negative isolates.

In an accompanying editorial, Jerome Ettienne, M.D., argued for routine testing for PVL.

“Regardless of the localization of the infection, the presence of PVL appears to be associated with increased severity, ranging from cutaneous infection requiring surgical drainage to severe chronic osteomyelitis and deadly necrotizing pneumonia,” said Dr. Ettienne of the National Reference Center of Staphylococcus, Lyon, France. “With the increased prevalence of community-acquired MRSA, which usually contain the genes encoding for PVL, it is important that clinical laboratories test for detection of this toxin in routine S. aureus isolates” (Clin. Infect. Dis. 2005;41:591-93).

Hyperglycemia Associated With Complications in Septic Neonates

BY JANE SALODOF MCNEIL
Southwest Bureau

Phoenix — Critically ill infants on total parental nutrition may face more complications and worse outcomes as a result of hyperglycemia induced by overfeeding, reported Daya A. Alaedeen, M.D., at the annual meeting of the American Pediatric Surgical Association.

A retrospective review of 37 premature infants treated for sepsis during a 1-year period found associations between hyperglycemia, morbidity, and mortality. The higher their maximum serum glucose concentration, the longer the babies were on mechanical ventilation and the longer they stayed in the hospital, Dr. Alaedeen said.

The average maximum glucose level was 100 mg/dL higher in 6 babies (16%) who died than in 31 babies who lived. It reached 241 mg/dL in nonsurvivors vs. 141 mg/dL in survivors.

Avoiding caloric overfeeding, possibly with tight glycemic control, may help reduce hyperglycemia-associated morbidity and mortality.

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Incidence of Sepsis Continues To Rise in the United States

SAN DIEGO — The rising incidence of severe sepsis in the past 2 decades has been accompanied by a decline in the case fatality rate, Charmaine Lewis, M.D., reported in a poster session at the 100th International Conference of the American Thoracic Society.

The incidence of severe sepsis in the United States rose from about 10 cases per 100,000 people in 1979 to 106 cases per 100,000 people in 2002.

“Severe sepsis is a common diagnosis for ICU admission—it’s the 10th most common cause of death in the United States, and it’s increasing in incidence,” Dr. Lewis told FAMILYPRACTICENEWS. “Key reasons for the increase since 1979, she said, include the emergence of HIV and the aging population. In addition, ‘we use a lot more immunosuppressive agents to treat what we used to consider mundane problems, such as rheumatoid arthritis,’ said Dr. Lewis, of the division of pulmonary, allergy, and critical care at Emory University, Atlanta.

Meanwhile, the case fatality rate among patients with severe sepsis dropped from 56% in 1979 to 36% in 2002.

The average age for all patients (65 years) did not change during the study period, but it was slightly lower for men than for women (65 vs. 67 years) and was lowest for African American males (56 years). Each year about $17 billion is spent on the care of patients with sepsis.

The National Institutes of Health funded the study.

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S. Aureus Is Agent Of Fatal Syndrome

BY JANE SALODOF MCNEIL
Southwest Bureau

Three children diagnosed with Waterhouse-Friderichsen syndrome died after rapidly progressive illness was traced to severe Staphylococcus aureus infection, said Patricia V. Aden, M.D., of the University of Chicago, and her associates.

“The three patients—a 15-month-old girl, a 9-month-old girl, and a 17-month-old boy—had been in good health prior to the onset of infection,” said Dr. Aden, of the National Reference Center of Staphylococcus, Lyon, France.

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Premortem cultures yielded methicillin-susceptible S. aureus in the first patient and methicillin-resistant S. aureus (MRSA) in the next two patients.

All the isolates were genetically related, which underscores the rise in community-associated MRSA, the investigators said (N. Engl. J. Med. 2005;353:1245-51).

“Characteristics of Waterhouse-Friderichsen syndrome include petechial rash, coagulopathy, cardiovascular collapse, and bilateral adrenal hemorrhage. Although extracorporeal membrane oxygenation has been associated with adren al hemorrhage in other studies, it was not associated with fatal illness in the two patients in this review who received it.”

“Regardless of the localization of the infection, the presence of PVL appears to be associated with increased severity, ranging from cutaneous infection requiring surgical drainage to severe chronic osteomyelitis and deadly necrotizing pneumonia,” said Dr. Ettienne of the National Reference Center of Staphylococcus, Lyon, France. “With the increased prevalence of community-acquired MRSA, which usually contain the genes encoding for PVL,” it is important that clinical laboratories test for detection of this toxin in routine S. aureus isolates” (Clin. Infect. Dis. 2005;41:591-93).

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