More Deep Infections Seen in Community MRSA

BY SHERRY BOSCHERT
San Francisco Bureau

SAN FRANCISCO — Invasive methicillin-resistant *Staphylococcus aureus* was more likely to cause skin and soft tissue disease or joint infections if acquired in the community rather than in a hospital, according to preliminary data from a large surveillance study.

Skin or soft tissue infection occurred in 34% of community-associated methicillin-resistant *S. aureus* (MRSA), compared with 10% of hospital-associated MRSA in the study of 6,413 cases of invasive MRSA in nine U.S. sites with a population of about 16 million people.

Endocarditis was more common with community-associated MRSA than with hospital-associated MRSA (12% vs. 4%), as were internal or deep-seated abscesses (9% vs. 4%) and septic arthritis, Susan M. Ray, M.D., said at the annual meeting of the Infectious Diseases Society of America.

"These differences may be explained by virulence factors in the staph strain, and/or by delay in presentation for care," said Dr. Ray of Emory University, Atlanta. "The clinical evaluation of community-associated MRSA should include the investigation of deep-seated foci of infections."

Patients with hospital-associated invasive MRSA were more likely to have uncomplicated bacteremia.

A previous analysis of 2001-2002 data from the Centers for Disease Control and Prevention reported that about 17% of MRSA cases in three sites were community associated, and about 7% of these were invasive disease (with a culture from a normally sterile site).

The current study analyzed federal data from 2004 and 2005 in nine geographic areas for culture-positive invasive MRSA infections. Surveillance officers reviewed patient records to classify 86% of cases as hospital-associated based on risk-factor criteria; all others were deemed community-associated infections (14%) or uncertain (less than 0.5%).

The rate of community-associated MRSA varied widely by geography, comprising 24% of invasive MRSA cases in Maryland but only 3% of cases in New York.

Compared with hospital-associated invasive MRSA, higher rates of community-associated MRSA were seen in children, smokers, and men with a history of intravenous drug use, HIV, or AIDS. Community-associated MRSA was less likely to be resistant to antimicrobials besides methicillin or to be resistant to multiple classes of antibiotics compared with hospital-associated MRSA.

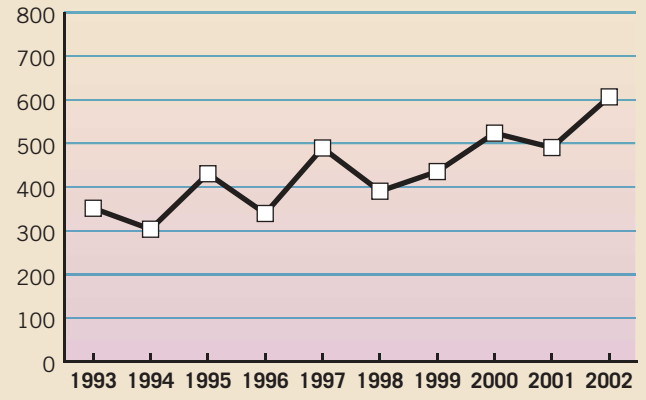
Community-associated MRSA accounted for 35% of invasive MRSA in children aged 3 years or younger, 50% of cases in 4- to 19-year-olds, 25% of patients aged 20-49 years, and 7% of those aged 50 years or older.

Cases were defined as hospital-associated MRSA if records showed at least one of the following: previous MRSA colonization or infection; a culture obtained more than 48 hours after hospitalization; the presence of an invasive device at the time of evaluation; or a history within the past year of hospitalization, surgery, dialysis, or residence in a long-term care facility.

Investigators in the study began collecting isolates from a sample of cases in 2005. "In the future, this will allow us to compare the epidemiologic classification of community-associated MRSA with its microbiologic characteristics," Dr. Ray said. ■

DATA WATCH

In-Hospital Deaths From Postoperative and Posttraumatic Infections Are on the Rise



Note: Based on weighted estimates from the Healthcare Cost and Utilization Project nationwide inpatient sample.
Source: Agency for Healthcare Research and Quality

KEVIN FOLEY, RESEARCH/DESIGN

Severe MRSA Infections Rising in the Young

BY NANCY WALSH
New York Bureau

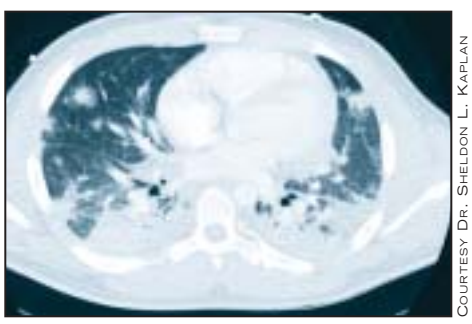
WARSAW — Community-acquired methicillin-resistant *Staphylococcus aureus* infections in children are on the increase around the world, and while most cases involve the skin and soft tissue and are susceptible to clindamycin, severe invasive infections requiring treatment with vancomycin also are being reported, Sheldon L. Kaplan, M.D., said.

Infections are being seen in children who have no traditional risk factors, such as recent hospitalization, underlying illness, or frequent antibiotic exposure.

It appears that a number of different clones of *S. aureus* have acquired resistance genes, and most isolates contain a gene that codes for a toxin called Panton-Valentine leukocidin (PVL). This cytotoxin causes leukocyte destruction and tissue necrosis, and has been associated with particularly severe forms of infection including hemorrhagic pneumonia, Dr. Kaplan said at an international congress of the World Society for Pediatric Infectious Diseases.

"In our hospital at the moment, *S. aureus* is the most common cause of pneumonia with empyema, which used to be predominantly caused by pneumococcus," he said.

It is not clear whether PVL is truly the causative factor in these highly virulent infections or is in some way participating in the ability of this organism to spread from person to person. What is clear is that mortality is high with *S. aureus* strains carrying the PVL gene: In one survey in France, the survival rate 48 hours after hospital admission was 63% among patients with PVL-positive infections, compared with 94% among those with PVL-negative infections (Lancet 2002;359:753-9).



COURTESY DR. SHELDON L. KAPLAN

CT scan of the lungs shows septic pulmonary emboli in a 14-year-old with severe staph sepsis and a DVT in the leg.

Among other severe infections that have been seen are pyomyositis and myositis in association with osteomyelitis. "It's true that we're doing more MRI and that allows us to see these muscle infections, but I don't think we missed these infections prior to MRI. The organism just has more ability to invade muscle tissue," said Dr. Kaplan, professor of pediatrics and infectious disease at Baylor College of Medicine, Houston.

Other infections that have been seen include extensive epidural abscesses, septic shock, and necrotizing fasciitis.

Almost all of the methicillin-resistant *S. aureus* (MRSA) isolates are susceptible to vancomycin, gentamicin, and trimethoprim-sulfamethoxazole. Rates of susceptibility to clindamycin vary somewhat, but in general are in the 92%-95% range. "In our area, clindamycin has been used quite a bit for community-acquired MRSA, and we are starting to see an increase in resistance, from 2% to 7%, so this is a warning," Dr. Kaplan said. Once resistance rates reach 10%-15%, clindamycin would not be an appropriate drug to use for initial empiric treatment, he added.

When asked about possible reasons why some children develop fulminant, overwhelming infections with MRSA, Dr. Kaplan said it may be host related. "Is it related to polymorphisms in toll-like receptor 2, or some other immune factor? We can't explain it. Many have not had an obvious site of skin infection that preceded their invasive infection." ■