Invasive MRSA May Require Vancomycin Therapy

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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 exposure to antibiotics.

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).

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.

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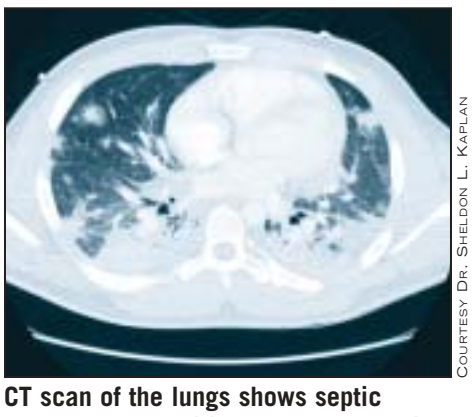
DR. KAPLAN

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

Almost all of the methicillin resistant *Staphylococcus 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.



COURTESY DR. SHELDON L. KAPLAN

CT scan of the lungs shows septic pulmonary emboli in a 14-year-old with severe staphylococcal sepsis.

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." ■

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