

Resistance rising

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News

The rise in the number and percentage of community-acquired *Staphylococcus aureus* infections that are methicillin resistant was highlighted at the 42nd annual meeting of the Infectious Diseases Society of America held in Boston in September 2004 (<http://www.idsociety.org>). Methicillin-resistant *S. aureus* (MRSA) infections are more commonly found in individuals who are or have been in a hospital or health care facility, but findings reported in more than 25 poster presentations showed a significant increase in MRSA infections in healthy individuals who have none of the usual risk factors. Kevin Purcell, a health care consultant for Driscoll Children's Hospital in Corpus Christi, Texas, and presenter of one of the posters, told the JCI, "The rate of methicillin resistance in our *Staph. aureus* isolates slowly increased from 3% in 1990 to 10% in 1999 and then rapidly increased over a 4-year period to 62% in 2003." Also worth noting is that the types of infections being caused by this community-acquired MRSA (CA-MRSA) can vary significantly from population to population. Most presentations showed that CA-MRSA infections occur primarily in the skin or soft tissue, but there was also a rise in the number of cases of CA-MRSA pneumonia, and Loren Miller and colleagues recorded in Los Angeles 14 CA-MRSA cases of necrotizing fasciitis, better-known to the public as flesh-eating bacteria. These infections are particularly [...]

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Also worth noting is that the types of infections being caused by this community-acquired MRSA (CA-MRSA) can vary significantly from population to population. Most presentations showed that CA-MRSA infections occur primarily in the skin or soft tissue, but there was also a rise in the number of cases of CA-MRSA pneumonia, and Loren Miller and colleagues recorded in Los Angeles 14 CA-MRSA cases of necrotizing fasciitis, better-known to the public as flesh-eating bacteria. These infections are particularly unusual because necrotizing fasciitis is usually caused by group A *Streptococcus*, not by *S. aureus*.

In Purcell's study, 94% of the infections were localized to the skin. "We had a much smaller percentage of invasive infections and only 1 case of the necrotizing fasciitis," Purcell said. "Our greatest concern was that the skin infections were becoming more and more common. Furthermore, the community-acquired MRSA strains have more of an ability to cause these kinds of infections than the non-MRSA strains."

Purcell believes that the data from his and the other studies suggest a real need to think carefully about how antibiotics are used now as compared to a few years ago.

CA-MRSA can be treated with several currently used antibiotics but is resistant to first-generation cephalosporins, which, not long ago, were the front-line antibiotics. Most doctors now generally use clindamyo-

sin or trimethoprim-sulfamethoxazole first for these skin infections, and these are still suitable for MRSA. Purcell did note, however, that they are seeing that some CA-MRSA infections "have inducible clindamycin resistance, so we need to determine what percentage of the MRSA have this inducible resistance. In our area [Corpus Christi], about 20% of the community-acquired MRSA are showing an inducible clindamycin resistance. Usually, it doesn't seem to matter for treating localized skin infections, but it is more important for treating the more invasive infections. There you want to use the most effective antibiotic first."



Kevin Purcell stated, "Compared with normal *Staph. aureus*, MRSA strains are also more virulent."

Purcell explained that because the epidemic had begun only in the last several years, clinicians may not yet have changed their treatment strategies. "I don't know that everybody has changed their empiric antibiotic use because they haven't needed to. But we are finding fewer and fewer communities now where most of the colonies are methicillin susceptible."

Because of these findings, Purcell's advice to clinicians is to "change the antibiotics you are using to the most recent antibiotics. Assume you are treating MRSA [infections], since the majority of these are going to be." He added that "for each doctor, it is important to look at data the local laboratories are generating." Local laboratories put out information called antibiograms, which show the percentages of bacterial

isolates in the community that are resistant to different antibiotics.

Purcell noted that choosing the appropriate antibiotic also depends on the type of infection. "For skin infections it doesn't matter as much; usually just draining the pus out of the wound is all that is necessary. It is more important to know the resistance pattern for the more invasive infections. For these types of infections, we start [the patients] on vancomycin until we know something else is going to work. Most of the time we can switch them to clindamycin. Unless they are clindamycin-resistance inducible, then we keep them on vancomycin."

Another issue Purcell raises is the importance of taking detailed family histories when treating a patient with any of these infections. "We are seeing clustering of these infections in families. The family just gets colonized with this organism, and we end up treating everyone. This can be done with an intranasal antibiotic, and we can get the whole colony."

The appearance and rapid rise of the CA-MRSA isolates remain a mystery and represent an important area for further research. "There is a lot of work being done on the genetics of these strains," Purcell said. "People thought they were coming from the hospital. More and more, we are learning they are genetically different from hospital strains, and something is causing them to rise in the community and rise very quickly."

Purcell said that it is still too early to tell whether the CA-MRSA isolates in different communities are from strains that are related to each other. He emphasized that there is a serious need for more extensive epidemiological studies. Such information might aid in understanding why there has been such a rapid rise in the number of resistant bacteria in the community and what that bodes for the future. "Will it go to [100%]?" Purcell asked rhetorically, "You can't predict it. It could stop at 65%."

"The biggest concern," Purcell stated, "is that we are eventually going to start seeing more and more of the invasive type of infections. And if we use a lot of these other drugs, [the CA-MRSA strains] will become resistant to these as well. Bacteria are good about becoming resistant." This problem is indeed key, as it comes at a time when the pipeline for new antibiotics is running dry.

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