Community-Associated MRSA: New Guidelines for a New Age

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This Just in Editor

Methicillin-resistant *Staphylococcus aureus* (MRSA) has become very common in communities. It is such a common occurrence, that some primary care providers (PCPs) tend to treat patients as MRSA-positive until proven otherwise. Most patients diagnosed with MRSA are healthy, young adults with no risk factors for immunocompromise.

A major cause of the development of antimicrobial resistance is the extensive use of antimicrobial agents. Consumers perceive new and expensive medications as necessary often without appropriate clinical indications. In an effort to provide consumer satisfaction, prescribers may have contributed to the growing threat of drug resistance.

### CDC Data

Eight percent to 20% of MRSA infections are found in the community, according to a study conducted by the Centers for Disease Control and Prevention (CDC). Twenty-five percent of those cases eventually required hospitalization. The study also found that the incidence of community-associated (CA) MRSA was more common in children less than 2 years of age than with any other age group. The most common presentations of CA-MRSA skin infections are abscesses, cellulitis, folliculitis, and impetigo; cellulitis and abscesses are the most common. An increase in necrotizing fasciitis and myositis from CA-MRSA was also noted. Necrotizing fasciitis attacks the already immunocompromised host.

### MRSA: A Local and Global Problem

Community-associated MRSA needs to be more clearly defined. Some define it as the discovery of colonization in the community while others refer to actual infections caused by MRSA. Community-associated MRSA has become endemic in large U.S. cities, such as Chicago, Houston, and Los Angeles. However, the increased prevalence in small communities has become quite apparent.

Blood infections due to MRSA occur in approximately 40% of medically institutionalized patients in Great Britain. It has become so widespread that Great Britain’s Secretary of State for Health is now considering holding hospitals and other medical institutions accountable for the MRSA rate by making them criminally liable for any occurrences.

Currently, nearly 60% of hospital infections in the United States are caused by MRSA. Many practitioners worry that if Great Britain succeeds in their legal accountability effort, the idea will drift to large healthcare institutions in the United States and eventually outpatient clinics, especially family practice clinics.

*Staphylococcus aureus* becomes methicillin-resistant when the *mecA* gene, located on the staphylococcal chromosomal cassette (SCC)*mec*, becomes mutated. To further complicate the issue, nosocomial infections are associated with different strains of SCC*mec* cassettes than strains associated with CA-MRSA. Nosocomial infections are associated with SCC*mec* types I, II, and III, whereas CA-MRSA is associated with type IV.

### Diagnosis

Risk factors for CA-MRSA include skin-to-skin contact; cuts and abrasions; contact with contaminated items or surfaces other than skin; living in crowded conditions; poor hygiene; and age younger than 2 years.

Clues that the wound may be CA-MRSA include erythema; edema; purulence; or thoughts or confirmation from the patient of a spider bite. Most MRSA wounds have a distinct dark red, slightly purple look to the erythematous border, along with firmness and tenderness.

At the clinic visit, the patient history of the wound should first be...
Case Studies

Case 1
Mr. Byron, a 39-year-old male, presented to his primary care provider (PCP) with the complaint of a “spider bite.” His history indicated that he was treated over the phone by a physician. Based on his description and symptoms, the physician prescribed cephalexin 500 mg three times a day for 7 days.

Mr. Byron went to his PCP 4 days after noticing the wound. The wound was located on the left inner thigh, just below the symphysis pubis. There was a well-circumscribed area of erythema, measuring 12 by 5 cm. The lesion was taut and firm, with a 1 cm center of necrosis. No nodes were palpable, but there was local tenderness. The patient had no fever. Based on the size of the wound, as well as the possibility of a brown recluse bite, a CBC, PT, PTT, and wound cultures were ordered. The laboratory work came back normal except for the wound culture, which showed MRSA (methicillin-resistant Staphylococcus aureus) with sensitivity to clindamycin and trimethoprim/sulfamethoxazole (TMP-SMX) for outpatient treatment.

The patient was treated with TMP-SMX twice daily for 10 days, in addition to warm soaks and incision and drainage when appropriate, along with packing of the wound. The cephalexin was stopped. He did very well and did not suffer from the necrosis or bleeding difficulties associated with a brown recluse bite, if the initial wound was from a brown recluse.

Case 2
Mr. Davis is a 16-year-old male who presented to his PCP with a “spider bite” on his right lateral knee. The area was extremely tender and firm with an erythematous area of 3 cm, as well as a pinpoint scab in the middle. He had no complaints of fever or other symptoms. Initial CBC and culture were negative, however, there was no open wound from which to obtain a culture. He had an erythematous area of 3 cm, as well as a pinpoint scab in the middle. He had no complaints of fever or other symptoms. Initial CBC and culture were negative, however, there was no open wound from which to obtain a culture. He was given 1 gram of ceftriaxone intramuscularly and sent home with TMP-SMX, prescribed twice daily for 10 days. Warm soaks were also ordered. He was instructed to return to the clinic 2 days later.

When the patient returned, the wound had opened on its own. A repeat, more complete culture was taken. There was now cavitation in the wound: approximately .75 cm in one direction and .25 cm in the other. The wound was packed, and the patient was told to continue his current antibiotic pending the results of the second wound culture. He was instructed to return to the clinic the next day because hospitalization might have been necessary, due to the cavities and potential chance for osteomyelitis. By the next day, the cavities had begun to heal by secondary intention and the pain had begun to decrease.

The culture came back MRSA positive, and the patient was continued on the TMP-SMX. Mupirocin 2% ointment was also added, and was to be used in the noses of the patient and each family member three times a day for 10 days. Three days later, when he returned to the clinic, the cavities had closed. There have been no recurrences of the infection.

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Treatment
Because methicillin-sensitive infections still occur at a higher rate than CA-MRSA, it is acceptable to begin the patient on a first-generation or other cephalosporin or doxycycline. The antibiotic can be changed if the culture is positive. The CDC found that when this treatment method was used, there was no difference in patient outcome.6 It is also acceptable to begin the patient on trimethoprim/sulfamethoxazole (TMP-SMX) or clindamycin if CA-MRSA is suspected. Both drugs can be used alone or in combination with rifampin (Rifadin). The addition of rifampin to TMP-SMX can increase the occurrence of hypersensitivity reactions. Community-associated MRSA is also often susceptible to doxycycline. However, this drug cannot be used in patients younger than 8 years of age because it stains teeth.6 Beginning treatment with TMP-SMX or clindamycin should be considered first in communities where CA-MRSA is responsible for ≥15% of wound and skin infections.6 Mupirocin 2% can also be placed on the wound and/or within the nose to eradicate the MRSA locally.1

Incision and drainage should be performed on amenable wounds when appropriate.6 Warm soaks may “ripen” the wound to facilitate this treatment.

The bacteria exudates can also be tested for the inducible macrolide-lincosamide-streptogramin B phenotype using the “D” test. This procedure is more expensive and time-consuming than normal wound culture and sensitivity testing, but is necessary if the patient is allergic to sulfa because this test checks the organism for resistance to clindamycin.6 Increased risk of pseudo-membranous colitis via Clostridium difficile is another major concern with the use of clindamycin.
Glycylcyclines
A new medication called tigecycline (Tygacil) was recently approved for the treatment of wound infections, including skin infections associated with MRSA. It is in a new class of drugs called glycylcyclines, which are derived from the tetracycline family. Unfortunately, this medication is only available in an intravenous form and is not available for outpatient use. Because it is a tetracycline, it cannot be used in pregnant women or in children younger than age 18 years.

Linezolid is a possible alternative because it can be used in children. It belongs to a new classification of antibiotics referred to as oxazolidinones and is as efficacious as vancomycin. Linezolid is available in both oral and parenteral forms however, its use may be limited by its expense.

Daptomycin is another recently approved antibiotic for treatment of CA-MRSA. It has not yet been sanctioned for use in children.

MRSA in the Primary Care Office
A recent study found one in five stethoscopes used by hospital clinicians were contaminated with Staphylococcus aureus, including one that harbored MRSA. This is not yet been sanctioned for use in children.

Aftercare and Prevention of Recurrence
Patient and family education is essential after the wound has healed because CA-MRSA can be recurrent and may affect family members. Basic hygiene principles should be reinforced, and patients should be advised to keep their fingernails short. Towels, under- wear, and sleepwear should be changed daily. All household members should be treated with intranasal mupirocin three times a day for 5 to 7 days, or for up to 30 days, if necessary. Possible carriers of MRSA can now easily be identified through a rapid, molecular-based assay test of the nasal passages called the IDI-MRSA test. Results are ready within 2 hours. This test is available through GeneOhm Sciences.

Reporting Occurrences
In some states, CA-MRSA is a reportable disease. Primary care providers should check with their local health department to determine whether reporting is required. Even if it is not necessary to report on a case-by-case basis, the local health department should be notified if a pocket of infection is identified in an institution or anywhere else that seems suspicious, including the workplace and school settings.

Maintain High Suspicion
Community-associated MRSA is becoming rampant in the United States. Primary care providers should carry a high index of suspicion when they evaluate a wound, especially one that is red, swollen, painful, and reported to be a “spider bite.” Primary care providers must also educate patients and families about recurrence. This is crucial in helping the patient, family, and significant others decrease the incidence of spread by instituting good hygienic practices. Primary care providers should stress the importance of applying mupirocin into the nares if deemed appropriate.

Additionally, PCPs must obtain occupational histories of the patients as well as social and family histories when pools of CA-MRSA are suspected so that the organism can be quickly identified and contained. Primary care providers must work closely with their local health departments, and make sure these agencies are on their lists for any alerts associated with CA-MRSA.

REFERENCES

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