

Pediatric Clips

Management of a skin infection in an adolescent

By Sherman Alter, MD

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Pediatric Clips from The Children's Medical Center of Dayton are quick reviews of common pediatric conditions.

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CASE STUDY

A 17-year-old male presents with a four-day history of localized swelling and tenderness of the left leg above the knee. His mother suspects it to be a spider bite. Examination of the leg reveals an area of erythema and warmth measuring approximately 7 by 9 cm. A 3 by 3 cm central fluctuance is evident, overlaid by a small necrotic area. He is afebrile. He is a varsity center on his high school football team. He does not recall any friends or contacts with similar lesions.

MANAGEMENT

The area was incised and a significant amount of purulent material was submitted for microbiologic culture and susceptibility testing. Because of the lesion's size, his physician prescribed oral clindamycin. A dressing was applied. He was sent home with instructions on wound care, with emphasis on optimizing hand hygiene. The culture yielded methicillin-resistant *Staphylococcus aureus* (MRSA), resistant to clindamycin by the

D-test. Despite clinical improvement at a two-day follow-up evaluation, his antibiotics were modified to complete five additional days of trimethoprim-sulfamethoxazole (TMP/SMX). Educational materials were provided to the family on methods to minimize transmission in the household. He was instructed to not play football until the lesion was fully healed. He was further instructed to wash hands frequently and refrain from sharing personal items (eg, as in the locker room).

CASE DISCUSSION

MRSA isolates were recognized shortly after the introduction of methicillin in the 1960s. For decades, infection with MRSA remained confined to patients who frequented health care settings, known as "healthcare-associated MRSA" (HA-MRSA). HA-MRSA is now a common cause of hospital-acquired infections. Furthermore, these organisms tend to be resistant to multiple antimicrobial drugs.

Since the mid-1990s, however, MRSA infections have been increasingly noted in individuals lacking established HA-MRSA risk factors: recent hospitalization, surgery, dialysis or presence of invasive medical devices. Community-associated MRSA (CA-MRSA) infections have disproportionately affected children and young adults. At Dayton Children's, a significant proportion of all *Staphylococcus aureus* isolates are MRSA; approximately 60% during the first half of 2007. Outbreaks have been noted in sports participants and day care center attendees. Transmission is facilitated by crowding, frequent skin contact with others (ie, athletes), compromised skin, contact with contaminated surfaces, sharing of personal items and lack of cleanliness. CA-MRSA isolates are resistant to fewer antibiotics than HA-MRSA, usually are derived from a distinct genotype, carry resistance genes different from those in HA-MRSA and commonly possess a gene that may contribute to the

severity of infection (PVL toxin gene). While serious infections occur, 75% of all CA-MRSA infections involve the skin.

CARE OF CA-MRSA SKIN INFECTIONS

In the 2000s, MRSA must be in the differential diagnosis of skin and soft tissue infections (abscesses, boils, cellulitis) and "spider bites."

1. Incision and drainage (I&D) of purulent skin infections should be routine. Simple I&D (ie, without antibiotics) may effectively treat small abscesses (<5 cm diameter) in afebrile, non-toxic-appearing patients. Such limited therapy should not be routinely performed in infants and those with facial lesions.
2. Purulent material should be submitted for culture and susceptibility testing. Because of inducible resistance within some MRSA isolates to clindamycin, the laboratory should report results of a D-test informing you of such antibiotic resistance and this antibiotic should not be utilized.
3. Superficial skin infections (impetigo) may be treated with topical mupirocin (Bactroban) or retapamulin (Alt-abax). Oral antibiotic therapy may be needed in patients with cellulitis or larger abscesses. Use local antibiotic

susceptibility data to guide treatment empirically. Clindamycin has been generally effective, but resistance to the agent is increasing. Experts suggest not using empiric clindamycin in areas with 10-15% MRSA resistance (Dayton Children's laboratory reports about 6-7% resistance). TMP-SMX and tetracycline (9 years of age or greater) are alternatives, but are ineffective against group A streptococci. Some would add a β -lactam antibiotic (eg, penicillin) to such empiric therapy. Due to its high cost and potential for myelosuppression, oral linezolid should not be routinely utilized. Patients with findings of systemic infection, those requiring more extensive surgical treatment and the seriously ill may need hospitalization. In general, infants less than 6 months of age should be managed in the hospital. If necessary, modify antibiotics once susceptibilities are determined. Routinely monitor for antibiotic side effects.

4. Patient education in caring for the wound and in utilizing methods to minimize transmission is critical. (available at www.cdc.gov/mrsa and <http://www.doh.wa.gov/Topics/Antibiotics/MRSA.htm>)
5. Follow up to insure eradication of the infection is vital.

Continued from the front.

The role of MRSA decolonization in the patient and within families, especially those with infection in other members, is unclear. Studies reveal that 60% of households of a hospitalized child with CA-MRSA infection have had an additional member with an MRSA infection within the previous six months. Some might use a short course of topical chlorhexidine bathing or the use of bleach in a bathtub (1/4 cup to a full tub), although data attesting to efficacy are not available.

KEY MRSA PREVENTION MESSAGES FOR PATIENTS AND PARENTS:

1. Keep draining wounds covered with clean, dry bandages.
2. Clean hands regularly with soap and water or alcohol-based hand gels. Always clean hands after contact with a draining wound.

3. Maintain general hygiene with regular bathing.
4. Do not share items that may be contaminated with wound drainage (eg, towels, bedding, or athletic equipment).
5. Launder contaminated clothing and linen after each use and dry thoroughly.
6. If unable to keep a wound covered with a clean, dry bandage at all times, do not participate in athletic activities with skin-to-skin contact until the wound is healed.
7. Clean equipment and other surfaces with which multiple individuals have had bare skin contact with an effective over the counter detergent/disinfectant.

SUMMARY

With increased prevalence of community MRSA infections (>60% of all *S. aureus* isolates

in our region), the cornerstones of therapy include I&D of lesions and culture of purulent material. Antibiotics active against MRSA should be initiated with ultimate therapy guided by laboratory susceptibility testing. Education of patients and families combined with regular follow-up is essential.

REFERENCES

1. Gorwitz R, Jernigan D, et al. Strategies for clinical management of MRSA in the community: Summary of an experts' meeting convened by the Centers for Disease Control and Prevention. March 2006. Available at http://www.cdc.gov/ncidod/dhqp/ar_mrsa_ca.html.
2. Daum R. Skin and soft tissue infections caused by methicillin-resistant *Staphylococcus aureus*. *N Engl J Med* 2007; 357:380-390.

FEATURED SPECIALIST



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