Just the Facts: Methicillin-resistant *Staphylococcus aureus* and soft tissue abscess in the emergency department

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CLINICAL SCENARIO

You have just drained a 2-cm soft tissue abscess on a 24-year-old woman's leg. You have heard conflicting advice about antibiotics for abscesses and wonder if you should prescribe one.

Soft tissue abscess used to be an easy emergency department (ED) presentation: perform an incision and drainage (I + D) and discharge your patient. Times have changed. Methicillin-resistant *Staphylococcus aureus* (MRSA) is now a major cause of soft tissue abscess in ED patients.[1] MRSA is, by definition, resistant to cloxacillin and cephalosporins. Almost all Canadian strains are susceptible to vancomycin and linezolid.[2] MRSA strains are variably susceptible to trimethoprim-sulfamethoxazole (TMP-SMX), tetra/doxycycline, and clindamycin, with pooled Canadian clindamycin resistance just over 40%.[2]

KEY CLINICAL QUESTIONS

1. How much MRSA is in my community?

Use your institutional antibiogram to understand your region's MRSA prevalence and resistance patterns.

There is tremendous variation in MRSA prevalence and antibiotic resistance patterns across Canada.[3] MRSA rates are generally higher in urban centers. Knowledge of regional antibiotic resistance reports, or "antibiograms," is essential both for managing these infections and for antibiotic stewardship.[4] Antibiograms are maintained and published regularly by health care institutions and communities across Canada.

2. What is the impact of additional antibiotics following I + D for soft tissue abscess?

Recent high-quality evidence shows improved cure rates and decreased new infections for adults and children taking TMP-SMX or clindamycin following I + D. However, adjuvant antibiotics increased the rate of drug-related adverse events.

The decision to offer adjuvant antibiotics to patients with soft tissue abscess treated with I + D is nuanced. The 2014 Infectious Diseases Society of America (IDSA) guidelines recommended antibiotics for soft tissue abscess only for patients with impaired host defences, systemic signs of infection, sepsis, or multiple/recurrent abscesses.[5] However, two recent clinical trials showed improvement in clinical cure rates and abscess recurrence following I + D for patients treated with antibiotics active against MRSA.[6,7] The first trial compared 1,265 adult patients with abscesses ≥ 2 cm

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treated with SMX-TMP v placebo. The cure rates were 80.5% for SMX-TMP compared with 73.6% placebo (difference of 7.2%, 95% confidence interval, 3.2–11.2%).[6] The second trial examined 505 adults and 281 children with abscesses <5 cm randomized to receive SMX-TMP, clindamycin or placebo following I + D. Clinical cure rates at 10 days were 83.1% SMX-TMP, 81.7% clindamycin, and 68.9% placebo. New infections at 1 month were lower with clindamycin (6.8%) than with SMX-TMP (13.5%) or placebo (12.4%) at the cost of increased adverse events (21.9% clindamycin v 11.1% TMP-SMX and 12.5% placebo).[7]

3. Why shouldn't I treat everyone with antibiotics after I + D?

The benefit of antibiotics is restricted to patients with MRSA. Harms from recent trials are underestimated as some (rare side effects and increased community resistance) were not measureable.

The benefits of antibiotics are restricted to patients with MRSA infection. Both studies had a MRSA prevalence of nearly 50%, which is more than most Canadian centers.[6,7] A policy that recommends treating everyone will unnecessarily expose many patients to side effects with no benefit. The placebo cure rates in both trials were at or above 70%; **most patients will do well with no further intervention beyond I + D, even if the abscess grows MRSA**. Antibiotics have many associated risks that these studies were not powered to detect, including allergic reactions, *Clostridium difficile* infections, Stevens-Johnson syndrome, and (specific to TMP-SMX), hyperkalemia and other drug-drug interactions. Soft tissue abscesses are one of the most common ED presentations. Routinely prescribing antibiotics to everyone with an abscess will significantly increase antibiotic use and higher community-based antibiotic use is associated with higher MRSA rates.[8]

4. How do I explain this risk and benefit to patients?

Shared decision making when prescribing antibiotics after I + D is important and there are decision aids available to assist this process.

A recent *British Medical Journal* "Rapid Recommendations" practice guideline (with linked patient-friendly infographics) can help physicians and patients with shared decision making.[9] It provides a "weak" recommendation for adjuvant antibiotics following I + D, a strong recommendation for choosing an antibiotic active against MRSA (TMP-SMX or clindamycin), and a weak recommendation for TMP-SMX over clindamycin based on a better adverse event profile. The guideline notes both the unmeasured impact of community resistance rates with increased antibiotic use and the high prevalence of MRSA in the studies. These recommendations apply only to centers where the community MRSA prevalence is greater than 10%.

5. What strategies can I use to reduce antibiotic prescriptions for soft tissue abscess?

Strategies to reduce unnecessary antibiotics include identification of high-risk patients, routine cultures, offering treatment only to high-risk patients or treatment failure after I + D, and active monitoring using delayed prescriptions.

Restricting antibiotic use to patients who will benefit is a key concept in reducing antibiotic footprints. Strategies to reduce unnecessary antibiotics include:

1) Restrict prescriptions to patients with recurrent/multiple abscesses, or those with significant risk factors for community-associated MRSA and challenges for telephone follow-up (homelessness, use of intravenous drugs, known outbreak or contact, institutionalized patients).[3]
2) Culture all abscesses and contact patients who grow MRSA. This allows discussion of antibiotic pros/cons and education around hygiene, recurrence, and the possibility of transmission to close contacts. Antibiotic choice, if needed, can be targeted to the culture results. Additionally, routine cultures allow accurate estimates of community MRSA rates and evolving resistance patterns.[2,3]

3) Active monitoring and delayed prescribing are strategies that have been effectively used in outpatient settings for other presentations. Because >70% of patients will have resolution of their abscess with I + D alone, dispensing a prescription alongside a definition of treatment failure and a timeline of when to fill it may reduce overuse.[8]

CASE RESOLUTION

You discuss the possibility of a MRSA infection with your patient and send off a culture. You decide together to hold off on antibiotics; your regional MRSA prevalence is 20% and she is not keen on unnecessary drugs. Two days later, the culture grows MRSA and you call her back. Her abscess is healing without any problems and does not require antibiotics. You discuss hygiene and recurrence, and recommend the CDC website on MRSA for additional information.

Just the Facts on MRSA and soft tissue abscess: Questions and tips

1) **How much MRSA is in my community?**
   Use your institutional antibiogram to understand your region's MRSA prevalence and resistance patterns.
2) **What is the impact of additional antibiotics following I + D for soft tissue abscess?**
   Recent high-quality evidence shows improved cure rates and decreased new infections for adults and children taking TMP-SMX or clindamycin following I + D. Adjuvant antibiotics increased the rate of drug-related adverse events.
3) **Why shouldn't I treat everyone with antibiotics after I + D?**
   The benefit of antibiotics is restricted to patients with MRSA. Harms from recent trials are underestimated as some (rare side effects and increased community resistance) were not measureable.
4) **How do I explain this risk and benefit to patients?**
   Shared decision making when prescribing antibiotics after I + D is important and there are decision aids available to assist this process.
5) **What strategies can I use to reduce antibiotic prescriptions for soft tissue abscess?**
   Strategies to reduce unnecessary antibiotics include identification of high-risk patients, routine cultures, offering treatment only to high-risk patients or treatment failure after I + D, and active monitoring using delayed prescriptions.

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