Management of community-associated methicillin-resistant *Staphylococcus aureus* skin abscesses in children

Joan L Robinson, Marina I Salvadori; Canadian Paediatric Society, Infectious Diseases and Immunization Committee

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Uncomplicated skin abscesses in previously well children are typically managed with drainage alone. An increasing percentage of such abscesses are due to methicillin-resistant *Staphylococcus aureus* infections. Although definitive data are lacking, drainage alone appears to be a reasonable strategy for methicillin-resistant *S aureus* skin abscesses, with antibiotics reserved for infants younger than three months of age, or for children who are systemically unwell, have underlying medical problems or have significant surrounding cellulitis.

Key Words: *Methicillin-resistant; Skin abscess;* Staphylococcus aureus

La prise en charge des abcès cutanés à *Staphylococcus aureus* méthicillinorésistant d'origine non nosocomiale chez les enfants

Les abcès cutanés non complexes chez des enfants auparavant en santé sont généralement pris en charge au moyen d'un simple drainage. Un pourcentage croissant de ces abcès est attribuable aux infections à *Staphylococcus aureus* méthicillinorésistant. Même si on ne possède pas de données irréfutables, le simple drainage semble constituer une stratégie raisonnable pour traiter les abcès cutanés à *S aureus* méthicillinorésistant, les antibiotiques étant réservés aux nourrissons de moins de trois mois, aux enfants ayant une maladie systémique, des problèmes médicaux sous-jacents ou une cellulite excentrique importante.

Skin abscesses in previously well children are primarily due to methicillin-susceptible *Staphylococcus aureus* (MSSA). However, recently, community-associated methicillin-resistant *S aureus* (CA-MRSA) has become a common cause of skin abscesses. This type of *S aureus* is resistant to all beta-lactam antibiotics including penicillins and cephalosporins. Preliminary data from the Canadian Paediatric Surveillance Program show that CA-MRSA infections occur all across Canada (Nicole Le Saux, personal communication). Children of all ages, including neonates, can become infected with MRSA. Clinical distinction between MSSA and MRSA causing an abscess is not possible, but in one study, over one-half of abscesses due to CA-MRSA were on the buttocks and lower limbs (1). Discharge or pus from an infected skin abscess should always be sent for culture because it is the only way to reliably identify MRSA. Recurrences are very common. Epidemiological risk factors associated with the spread of CA-MRSA in the child or family include close skin-to-skin contact, openings in the skin such as cuts or abrasions, contaminated items and surfaces, crowded living conditions and poor hygiene. Clusters or increased rates have been reported in Aboriginal populations, athletes, daycare attendees, military recruits, intravenous drug users, men who have sex with men, and prisoners, but many infected children have no risk factors.

Until CA-MRSA became a problem, drainage alone was the accepted therapy for uncomplicated skin abscesses (1). Similar to MSSA, CA-MRSA can cause osteomyelitis, septic arthritis, necrotizing fasciitis, sepsis and pneumonia (especially following influenza), so concern has been expressed that CA-MRSA abscesses could progress to invasive disease if not treated with oral antibiotics (2), especially in neonates. However, the only paediatric randomized trial in the CA-MRSA era did not describe any of these complications, and showed equivalent cure rates at 10 days with trimethoprim/sulfamethoxazole (TMP/SMX) versus placebo postdrainage with more recurrences at the 10-day but not at the 30-day follow-up in the placebo group (1). Therefore, most children can be managed initially with drainage alone (Table 1). Patients must be reassessed if they develop systemic symptoms, have worsening local symptoms or have demonstrated no improvement after 48 h. However, empirical oral or parenteral antibiotics should be used from the day of presentation if the child is younger than three months of age, or has significant associated cellulitis, fever or other systemic signs of illness.

In the limited situations in which one chooses to use antibiotics for a skin abscess postdrainage, TMP/SMX covers almost 100% of MSSA and CA-MRSA, and is generally well tolerated. There are concerns regarding the use of TMP/SMX in serious infections because penetration into pus, lungs and thick-walled abscesses is poor, and *S aureus* may produce sufficient thymidine to inactivate the drug (3). However, these concerns do not preclude its use for an uncomplicated skin abscess. Doxycycline is a good option for children eight years of age or older who can swallow pills. Another option is clindamycin, but an increasing percentage of CA-MRSA isolates are resistant, the suspension is unpalatable and this drug increases the risk of *Clostridium difficile* colitis to a greater extent than does TMP/SMX. Increasing resistance is also a problem for fluoroquinolones including ciprofloxacin. An oral agent that would cover most CA-MRSA is linezolid, but this drug is prohibitively expensive and is not advised for uncomplicated skin abscesses.

One limitation of TMP/SMX is poor coverage for group A streptococcus, but this organism is a rare cause of skin abscesses, and abscesses due to this organism are likely to resolve postdrainage with no adjunctive antibiotics. However, in the setting of significant cellulitis

Correspondence: Canadian Paediatric Society, 2305 St Laurent Boulevard, Ottawa, Ontario K1G 4J8. Telephone 613-526-9397, fax 613-526-3332, websites www.cps.ca, www.caringforkids.cps.ca

TABLE 1
Management of skin abscesses in children pending culture results

Setting	Management after abscess drained
A. Child <1 month of age	Most should be admitted for intravenous antibiotics (usually vancomycin with or without other agents). Outpatient management with clindamycin can be considered if the abscess is small (<1 cm), the child was previously well and has no fever or signs of systemic illness, and the parents seem reliable
B. Previously well child, with skin abscess and	
1 to 3 months of age • no fever • no other systemic signs of illness	TMP/SMX* orally pending cultures
3 months of age or older • low-grade fever (<38.0°C) or no fever • no other systemic signs of illness	Observe after drainage – consider antibiotics only if the child does not improve or the culture grows an organism other than *Staphylococcus aureus* (such as group A streptococcus)
3 months of age or older • significant surrounding cellulitis • low-grade fever (<38.0°C) or no fever • no other systemic signs of illness	TMP-SMX and cephalexin orally pending cultures
C. All other scenarios with a skin abscess	Often intravenous antibiotics – choice depends on many factors

*All abscesses should be drained. Antibiotics would normally be given for a seven-day course. *Use of trimethoprim/sulfamethoxazole (TMP/SMX) in infants younger than two months of age remains controversial. Most experts believe there is no risk of kernicterus in well infants older than four weeks of age, and many would also use it in infants two to four weeks of age with no visible jaundice*

with a skin abscess for which one wants to cover group A streptococcus, MSSA and MRSA, an option appropriate for outpatients is to add a second antibiotic (typically cephalexin) to TMP/SMX pending cultures. For skin infections other than abscesses, beta-lactams remain appropriate therapy in most circumstances, although the local prevalence of CA-MRSA, the severity of illness and patient comorbidities must be taken into account.

Parents are often very concerned when they are told that their child has been infected with this 'superbug'. Excellent parent handouts are available online at www.cdc.gov/mrsa/.

Decolonization is not usually advised because failure is common even with multiple interventions involving the child and family members.

CONCLUSION

The vast majority of skin abscesses resolve postdrainage without antibiotics. However, clinicians may choose to start antibiotics pending culture, especially in infants younger than three months of age, or in children with serious medical problems, signs of systemic illness or significant surrounding cellulitis.

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Consultants: *Drs James Kellner, Alberta Children's Hospital, Calgary, Alberta; Noni MacDonald, IWK Health Centre, Halifax, Nova Scotia; Dorothy Moore, The Montreal Children's Hospital, Montreal, Quebec*

Principal authors: *Drs Joan L Robinson, Edmonton, Alberta; Marina I Salvadori, London, Ontario*