

# Antibiotics for simple skin abscesses: the new evidence in perspective

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Two studies, both published in *New England Journal of Medicine* in the last 2 years, go a long way in answering, once and for all, whether antibiotics are beneficial after incision and drainage (I&D) of simple skin abscesses. This is an age-old question in emergency medicine and one that grew more urgent with the emergence of community-associated methicillin-resistant *Staphylococcus aureus* (CA-MRSA) in the late 1990s and early 2000s. While CA-MRSA can cause serious invasive infections, it predominantly causes skin and soft tissue abscesses, mostly simple furuncles in young, healthy patients. Between 1997 and 2005, for example, ED visits for skin and soft tissue infections rose more than 50%, with 59% of culturable infections due to MRSA.<sup>1</sup> Do all these furuncles we are now seeing really require a prescription for MRSA-active antibiotics?

*'A strategy of routinely treating all skin abscesses with adjunctive antibiotics seems perfectly justified'.*

There have been many studies over the last 40 years examining the benefit of adjunctive antibiotics (in addition to I&D) for simple skin abscesses, though most are small and low quality. A 2013 meta-analysis, which pooled the results of the 12 highest quality studies and focused in particular on MRSA infections, found no evidence of benefit with antibiotics.<sup>2</sup> The 2014 Infectious Disease Society of America (IDSA) guidelines on skin and soft tissue infection treatment emphasise that providing good surgical drainage is the most important treatment for uncomplicated skin abscesses.<sup>3</sup> The guidelines recommend reserving adjunctive antibiotics for complicated infections, defined as those with fever or toxicity, greater than 5 cm of surrounding cellulitis, or occurring in an immunocompromised host. Nonetheless, in an international poll of physicians who were given a hypothetical case of an uncomplicated skin abscess that had undergone I&D, only 31% voted for withholding adjunctive antibiotics. Respondents from North America were much more likely to give antibiotics than those from Europe.<sup>4</sup>

It was in this setting—with a recent increase in CA-MRSA skin abscesses, a lack of quality evidence on the benefit of antibiotics and wide variation in practice—that in 2009, with funding from the U.S. National Institutes of Health, two large, multicentre, randomised controlled trials were undertaken to investigate the effect of off-patent antibiotics on uncomplicated skin abscesses.

The first to be published was by Talan *et al*, in 2016.<sup>5</sup> It enrolled 1247 subjects 12 years of age or

older with simple cutaneous abscesses (eg, <1% were febrile) that yielded pus on surgical exploration and were treated as outpatients. Subjects were randomised to trimethoprim-sulfamethoxazole (TMP/SMX) (320 mg/1600 mg (two double-strength tablets) twice daily) versus placebo for 7 days. The primary outcome, clinical cure at 7–14 days in the intention-to-treat analysis, occurred in 80.5% of the TMP/SMX group and 73.6% of the placebo arm (absolute risk reduction (ARR) 6.9%; number needed to treat (NNT) 14). Two secondary outcomes, skin infections at a new site and occurrence of similar infections in a household member, were also less common in the TMP/SMX group. There was no statistical difference in adverse events. Only four patients, two in each arm, had a serious associated infection. Forty-five per cent of wound cultures grew MRSA and 16% grew methicillin-susceptible *S. aureus*. A subsequent subgroup analysis of this data showed that treatment effect was similar across all lesion sizes, but somewhat greater in subjects with fever, an MRSA isolate or prior history of MRSA infection.<sup>6</sup>

*'Even in the antibiotic groups there was still a roughly 20% treatment failure rate'.*

The second trial, by Daum *et al*, published in 2017, had 786 subjects.<sup>7</sup> This study differed from Talan *et al* somewhat in that it enrolled children as well as adults, was limited to abscesses less than 5 cm in diameter and had three treatment arms, TMP/SMX (a single double-strength tablet twice daily for adults), clindamycin (300 mg three times a day for adults) and placebo, given for 10 days. The primary outcome, clinical cure at days 17–20, occurred in 83% of the clindamycin group, 82% of the TMP/SMX group and 69% of the placebo group (ARR 14%; NNT 7 for clindamycin). In this study, clindamycin, but not TMP/SMX, reduced the rate of new or recurrent lesions at 1 month, whereas the clindamycin group had more adverse effects, primarily mild to moderate diarrhoea (number needed to harm 11). The bacteriology results were similar to those in Talan *et al*.

How should this new evidence change practice? A strategy of routinely treating all skin abscesses with adjunctive antibiotics seems perfectly justified. There is now robust evidence showing a measurable benefit in even the smallest abscesses. On the other hand, I believe there is still good reason for a less sweeping approach. For me, the argument not to use adjunctive antibiotics in every case begins with the NNT, which is between 7 and 14 according to these trials. Let's call it 10.



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What does an NNT of 10 mean when the disease in question is an uncomplicated abscess? First, it goes without saying that surgical drainage is always required; we have no idea what the benefit of antibiotics might be without a good I&D. Second, recall that in the antibiotic groups there was still a roughly 20% treatment failure rate. So, whether or not adjunctive antibiotics are given, 2 to 3 out of every 10 patients will experience some kind of treatment failure within 7–20 days of the I&D. This typically means the drainage or purulent cellulitis fails to resolve completely or a new abscess springs up. This fact underscores the importance of good aftercare and follow-up instructions. In most cases of ‘treatment failure’, you will simply need to make sure that any sequestered purulence is again unroofed and able to drain, and that the area is scrubbed with soap and water. At that point, you can prescribe antibiotics if not prescribed initially, or, if antibiotics had been prescribed, ensure the patient was really taking them or switch agents. In other words, the stakes are fairly low. Keeping this point in mind, the NNT of 10 means that if you prescribe antibiotics to 10 consecutive patients with uncomplicated abscesses, one less patient will have a treatment failure than if you had withheld antibiotics in those 10 patients.

*‘For me, the argument not to use adjunctive antibiotics in every case begins with the NNT’.*

There are other issues you may wish to consider. Recurrences of purulent infections at the same, or more often a separate, location seemed to be reduced with antibiotics. Again, it is important to recognise that such recurrences can be expected in 7%–14% of patients, with or without antibiotics. The Talan study also showed an early reduction in the occurrence of similar infections in household members, from 4% to 2% with antibiotics. Reducing recurrences and spread to close contacts might be an important consideration in households experiencing a furunculosis outbreak, or where infants or chronically ill or immunocompromised individuals reside. In such cases, in addition to adjunctive antibiotics, it may be reasonable to also consider measures such as cleaning household surfaces with bleach and briefly treating the patient and all close contacts with nasal mupirocin and chlorhexidine or dilute bleach baths, beginning after completion of the antibiotic course.

*‘The studies by Talan et al. and Daum et al. provide a fairly precise measure of the magnitude of the benefit: it is small’.*

The most important additional consideration, however, is patient preference. Many patients, realising that there is an active bacterial infection on their body, may desire, indeed insist

on, antibiotics. Some will feel that a small but definite improvement in cure rate is well worth a brief course of inexpensive antibiotics. But others will be disinclined to take antibiotics unless absolutely necessary—and I would respect their wishes. In the case of clindamycin, some may feel that the increase in treatment-associated diarrhoea, roughly equal in magnitude to the improved abscess cure rate, is too high. My patients might be interested to hear that, were it me or my family member with a small skin abscess, I would choose no antibiotics after I&D. I might also share my unproven suspicion that frequent soaking and washing in hot soapy water, in the first days following I&D, is likely more important than systemic antibiotics. But I would also remind them that some of my comfort with not taking antibiotics is because I am an expert at monitoring these infections for persistent cellulitis or recurrence—which are fairly likely outcomes regardless of the decision whether or not to take adjunctive antibiotics.

The studies by Talan *et al* and Daum *et al* answer conclusively the question of whether adjunctive antibiotics are beneficial for uncomplicated skin abscesses: they are. And they provide a fairly precise measure of the magnitude of the benefit: it is small. It is unlikely that there will be additional research on this question. What remains to be seen is how the findings from these studies will be incorporated into guidelines. Given the importance of the new data, updated guidelines from the IDSA and other expert organisations should be forthcoming.

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