

Brief description of patient problem/setting (summarize the case very briefly)

A 56-year-old female with a past medical history of type 2 diabetes presents for a follow-up appointment. She was evaluated two days prior for the same issue regarding an abdominal abscess; however, the wound was too hard to be incised and drained, and needed to be more fluctuant, so the procedure was deferred. She has been applying frequent warm compresses to make the wound softer for drainage since her last visit. Today, an I&D procedure was performed in the office, the wound was packed with ribbon, and gauze was applied over it. She denies any fever, chills, or other systemic symptoms. The clinician must decide whether adding antibiotics or just incision and drainage alone is sufficient management of a skin abscess.

Search Question: In adults with uncomplicated skin abscesses undergoing incision and drainage, does adjunctive oral antibiotic therapy compared to incision and drainage alone improve clinical cure rates?

Question Type: What type of question is this?

☒ **Treatment** ☐ Diagnosis ☐ Prognosis ☐ Screening ☐ Prevalence ☐ Harms

Assuming that the highest level of evidence to answer your question will be meta-analysis or systematic review, what other types of study might you include if these are not available (or if there is a much more current study of another type)?

Systematic review and meta-analysis provide the highest level of evidence, and if these were not available, then the next highest level of evidence that I would use is randomized controlled trials (RCTs), because they encourage blinding, and there is direct comparison with very minimal to no bias in this type of study. RCTs would be able to provide strong evidence because they often use large groups to assess data. In this case, RCTs can inform whether using antibiotics in addition to antibiotics gives better cure rates than just an incision and drainage procedure alone for skin abscesses. Another type of study that can be used in place of RCTs, if also unavailable, is a prospective cohort study, which can be used to assess outcomes over a period of time.

P	I	C	O
Skin abscess	Incision and drainage	No antibiotics	Recurrence

Soft tissue infection	Antibiotics	Conservative management	Wound healing
Uncomplicated abscess		I&D alone	

PICO Search Terms Search tools and strategy used:

Please indicate what databases/tools you used, provide a list of the terms you searched together in each tool, and how many articles were returned using those terms and filters.

Database	Search Terms Used	Number of Results	Filters/Limiters Applied	Notes/Observations
PubMed	("skin abscess" OR "uncomplicated skin abscess") AND ("incision and drainage") AND ("antibiotics")	68	English language, last 10 years, adults, human studies, RCT or systematic review	Broad coverage of articles on infectious diseases. Many RCTs and systematic reviews are available.

Cochrane Library	("uncomplicated skin abscess") AND ("incision and drainage") AND ("adjunctive antibiotics")	39	Systematic reviews and meta-analyses, the last 10 years	High-quality systematic reviews focused on the effectiveness of antibiotics.
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Google Scholar	"skin abscess" AND "incision and drainage" AND antibiotics	49	Sorted by relevance	Broad search engine that includes many journal articles.
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I chose PubMed, Cochrane Library, and Google Scholar to conduct my search for articles. I used multiple terms to ensure that I found sufficient evidence across the databases, including “skin abscess,” “uncomplicated skin abscess,” “adjunctive antibiotics,” and “incision & drainage.” I also focused on filters that would refine my search for articles, including filters like the English language, recent publications, and ensuring that it is within 10 years, etc. After applying these filters, I chose three relevant articles that would answer my PICO question.

Results found:

Identify at least 3 articles (or other appropriate reputable sources) that answer your specific question with the highest available level of evidence.

1. Trimethoprim-Sulfamethoxazole versus Placebo for Uncomplicated Skin Abscess **<https://pubmed.ncbi.nlm.nih.gov/26962903/>**

Talan, D. A., Mower, W. R., Krishnadasan, A., Abrahamian, F. M., LoVecchio, F., Steele, M. T., Rothman, R. E., Moran, G. J., & the EMERGENCY ID NET Study Group. (2016). *Trimethoprim-sulfamethoxazole versus placebo for uncomplicated skin abscess*. The New England Journal of Medicine, 374(9), 823–832.
<https://doi.org/10.1056/NEJMoa1507476>

Type of Study: Randomized controlled trial (RCT)

Abstract

Objective: To evaluate the difference between adjunctive trimethoprim-sulfamethoxazole versus placebo in patients with skin abscesses treated with incision and drainage to assess cure rates.

Methods: We conducted a randomized trial at five U.S. emergency departments to determine whether trimethoprim-sulfamethoxazole (at doses of 320 mg and 1600 mg, respectively, twice daily, for 7 days) would be superior to placebo in outpatients older than 12 years of age who had an uncomplicated abscess that was being treated with drainage. The primary outcome was clinical cure of the abscess, assessed 7 to 14 days after the end of the treatment period.

Results: The median age of the participants was 35 years (range, 14 to 73); 45.3% of the participants had wound cultures that were positive for MRSA. In the modified intention-to-treat population, clinical cure of the abscess occurred in 507 of 630 participants (80.5%) in the trimethoprim-sulfamethoxazole group versus 454 of 617 participants (73.6%) in the placebo group (difference, 6.9 percentage points; 95% confidence interval [CI], 2.1 to 11.7; $P=0.005$). In the per-protocol population, clinical cure occurred in 487 of 524 participants (92.9%) in the trimethoprim-sulfamethoxazole group versus 457 of 533 participants (85.7%) in the placebo group (difference, 7.2 percentage points; 95% CI, 3.2 to 11.2; $P<0.001$).

Trimethoprim-sulfamethoxazole was superior to placebo with respect to most secondary outcomes in the per-protocol population, resulting in lower rates of subsequent surgical drainage procedures (3.4% vs. 8.6%; difference, -5.2 percentage points; 95% CI, -8.2 to -2.2), skin infections at new sites (3.1% vs. 10.3%; difference, -7.2 percentage points; 95% CI, -10.4 to -4.1), and infections in household members (1.7% vs. 4.1%; difference, -2.4 percentage points; 95% CI, -4.6 to -0.2) 7 to 14 days after the treatment period. Trimethoprim-sulfamethoxazole was associated with slightly more gastrointestinal side effects (mostly mild) than placebo. At 7 to 14 days after the treatment period, invasive infections had developed in 2 of 524 participants (0.4%) in the trimethoprim-sulfamethoxazole group and in 2 of 533 participants (0.4%) in the placebo group; at 42 to 56 days after the treatment period, an invasive infection had developed in 1 participant (0.2%) in the trimethoprim-sulfamethoxazole group.

Conclusion: In settings in which MRSA was prevalent, trimethoprim-sulfamethoxazole treatment resulted in a higher cure rate among patients with a drained cutaneous abscess than placebo.

Why did I select this article:

I decided to use this article because of the quality of the evidence it provides; it is a randomized controlled trial (RCT) that assesses the effects of antibiotics following an incision and drainage procedure for skin abscesses. The study evaluates the difference between trimethoprim-sulfamethoxazole versus a placebo. The RCT was conducted in five emergency department settings and included over 1,200 patients who were randomized into treatment groups, and it was found that the group receiving the antibiotic had a more successful outcome than the placebo alone, as patients had fewer recurrent skin infections. This article demonstrates that antibiotics can provide better coverage than without them in abscesses.

Key Points:

1. Trimethoprim-sulfamethoxazole had significantly better cure rates for abscesses versus placebo, 80.5% versus 73.6%, respectively
2. The number needed to treat was 14 for the prevention of just one failed treatment.
3. The addition of an antibiotic for skin abscesses reduced the recurrence rate of another skin infection

2. Antibiotics for uncomplicated skin abscesses: systematic review and network meta-analysis <https://bmjopen.bmj.com/content/8/2/e020991>

Wang, W., Chen, W., Liu, Y., Siemieniuk, R., Li, L., Martinez-Zapata, M. J., Kopec, J. A., Guyatt, G. H., & Agoritsas, T. (2018). Antibiotics for uncomplicated skin abscesses: Systematic review and network meta-analysis. *BMJ Open*, 8(2), e020991. <https://doi.org/10.1136/bmjopen-2017-020991>

Type of Study: Systematic Review and Network Meta-Analysis

Abstract

Objective To assess the impact of adjunctive antibiotic therapy on uncomplicated skin abscesses.

Review methods Reviewers independently screened abstracts and full texts for eligibility, assessed risk of bias and extracted data. We performed random-effects meta-analyses that compared antibiotics with no antibiotics, along with a limited number of prespecified subgroup hypotheses. We also performed network meta-analysis with a Bayesian framework to compare effects of different antibiotics. Quality of evidence was assessed with The Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach.

Results Fourteen RCTs including 4198 patients proved eligible. Compared with no antibiotics, antibiotics probably lower the risk of treatment failure (OR 0.58, 95% CI 0.37 to 0.90; low quality), recurrence within 1 month (OR 0.48, 95% CI 0.30 to 0.77; moderate quality), hospitalisation (OR 0.55, 95% CI 0.32 to 0.94; moderate quality) and late recurrence (OR 0.64, 95% CI 0.48 to 0.85; moderate quality). However, relative to no use, antibiotics probably increase the risk of gastrointestinal side effects (trimethoprim and sulfamethoxazole (TMP-SMX): OR 1.28, 95% CI 1.04 to 1.58; moderate quality; clindamycin: OR 2.29, 95% CI 1.35 to 3.88; high quality) and diarrhoea (clindamycin: OR 2.71, 95% CI 1.50 to 4.89; high quality). Cephalosporins did not reduce the risk of treatment failure compared with placebo (moderate quality).

Conclusions In patients with uncomplicated skin abscesses, moderate-to-high quality evidence suggests TMP-SMX or clindamycin confer a modest benefit for several important outcomes, but this is offset by a similar risk of adverse effects. Clindamycin has a substantially higher risk of diarrhoea than TMP-SMX. Cephalosporins are probably not effective.

Why did I select this article:

I chose this article since it is a systematic review and a meta-analysis, which represents the highest level of evidence-based information. It analyzes randomized controlled trials (RCTs) that

compare various types of antibiotics that are used for uncomplicated skin abscesses, which answers my pico question directly on the management of abscesses after an incision and drainage procedure. It focuses on comparing 14 RCTs with approximately 4,000 participants who received different antibiotics for the treatment of abscesses, checking their efficacy, and this included trimethoprim-sulfamethoxazole, clindamycin, and cephalosporins. This can help guide management for clinicians who are considering what medications to give after an I&D procedure. The results demonstrated that Bactrim and clindamycin provided adequate benefits since they both cover MRSA. Whereas the cephalosporin medications showed limited efficacy in treating abscesses, due to not covering MRSA, many skin infections, including abscesses, are caused by it. The article did discuss how these antibiotics cause side effects, mainly gastrointestinal by clindamycin; it highlights why antibiotics are useful regardless of this. Overall, the article provides insight into a clinician's decision-making for adjunctive therapy post I&D.

Key Points:

1. There is sufficient evidence in support of adding antibiotics for an uncomplicated abscess following incision and drainage procedures
2. Cephalosporins must not be used, as they do not offer coverage against MRSA
3. Both TMP-SMX and Clindamycin are effective antibiotics; TMP-SMX has less risk of causing gastrointestinal side effects

3. A Placebo-Controlled Trial of Antibiotics for Smaller Skin Abscesses

<https://www.nejm.org/doi/full/10.1056/NEJMoa1607033>

Daum, R. S., Miller, L. G., Immergluck, L., Fritz, S., Creech, C. B., Young, D., Kumar, N., Downing, M., Pettibone, S., Hoagland, R., Eells, S. J., Boyle, M. G., Parker, T. C., & Chambers, H. F., for the DMID 07-0051 Team. (2017). A placebo-controlled trial of antibiotics for smaller skin abscesses. *The New England Journal of Medicine*, 376(26), 2545–2555.
<https://doi.org/10.1056/NEJMoa1607033>

Type of Study: Randomized Controlled Trial (RCT)

Abstract

Background

Uncomplicated skin abscesses are common, yet the appropriate management of the condition in the era of community-associated methicillin-resistant *Staphylococcus aureus* (MRSA) is unclear.

Methods

We conducted a multicenter, prospective, double-blind trial involving outpatient adults and children. Patients were stratified according to the presence of a surgically drainable abscess, abscess size, the number of sites of skin infection, and the presence of nonpurulent cellulitis. Participants with a skin abscess 5 cm or smaller in diameter were enrolled. After abscess incision and drainage, participants were randomly assigned to receive clindamycin, trimethoprim–sulfamethoxazole (TMP-SMX), or placebo for 10 days. The primary outcome was clinical cure 7 to 10 days after the end of treatment.

Results

We enrolled 786 participants: 505 (64.2%) were adults and 281 (35.8%) were children. A total of 448 (57.0%) of the participants were male. *S. aureus* was isolated from 527 participants (67.0%), and MRSA was isolated from 388 (49.4%). Ten days after therapy in the intention-to-treat population, the cure rate among participants in the clindamycin group was similar to that in the TMP-SMX group (221 of 266 participants [83.1%] and 215 of 263 participants [81.7%], respectively; $P=0.73$), and the cure rate in each active-treatment group was higher than that in the placebo group (177 of 257 participants [68.9%], $P<0.001$ for both comparisons). The results in the population of patients who could be evaluated were similar. This beneficial effect was restricted to participants with *S. aureus* infection. Among the participants who were initially cured, new infections at 1 month of follow-up were less common in the clindamycin group (15 of 221, 6.8%) than in the TMP-SMX group (29 of 215 [13.5%], $P=0.03$) or the placebo group (22 of 177 [12.4%], $P=0.06$). Adverse events were more frequent with clindamycin (58 of 265 [21.9%]) than with TMP-SMX (29 of 261 [11.1%]) or placebo (32 of 255 [12.5%]); all adverse events resolved without sequelae. One participant who received TMP-SMX had a hypersensitivity reaction.

Conclusions

As compared with incision and drainage alone, clindamycin or TMP-SMX in conjunction with incision and drainage improves short-term outcomes in patients who have a simple abscess. This benefit must be weighed against the known side-effect profile of these antimicrobials.

Why did I select this article:

This article was on a large randomized controlled trial that evaluates the effectiveness of antibiotics that are adjunctive to incision and drainage procedures for skin abscesses. This article is particularly unique because it includes children in their study, approximately over 200 out of the total 786 participants, which is a significant number to conduct a study on. It also analyzed

the pathogens that are most common in skin infections, MRSA, and Staphylococcus aureus. Groups were split based on treatment, clindamycin, trimethoprim-sulfamethoxazole, and a placebo. The results explained how, while both antibiotics did improve skin infections, those treated with clindamycin presented with fewer recurrent infections, but trimethoprim-sulfamethoxazole had fewer side effects. This article helped provide quality evidence that allowed us to understand why antibiotics can be necessary for skin abscesses, since it provides coverage against common skin infection pathogens.

Key Points:

1. Adjunctive therapy has better cure rates in comparison to an I&D procedure alone, approximately 14% improvement
2. Includes the pediatric population (35.8%) in their study, versus other studies, and this is significant because it addresses the gap in evidence with a different demographic, as pediatric patients also develop frequent skin abscesses
3. Clindamycin has better recurrence rates, but TMP-SMX has fewer adverse reactions

What is the clinical “bottom line” derived from these articles in answer to your question?

Patients undergoing incision and drainage procedures benefit from adjunctive antibiotic treatment. For example, trimethoprim-sulfamethoxazole or clindamycin provides effective coverage for skin abscesses, particularly in cases involving Staph aureus and MRSA, and significantly improves the cure rate compared to drainage alone. Adding antibiotics also reduces recurrence and the need for repeat procedures. While there are risk of adverse reactions with using antibiotics, which are mainly gastrointestinal, the effects are minimal in comparison to their benefits. There are instances where patients with abscesses can be managed with observation if it's small or just incision and drainage alone, and antibiotics are unnecessary to be added. Therefore, this is why other factors must be taken into consideration, including the patient and their comorbidities, shared decision making between provider and patient, as well as any resistance patterns.