Inappropriate Antibiotic Use in Soft Tissue Infections

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Hypothesis: Many soft tissue infections treated with surgical drainage resolve even when treated with antibiotics not active against the organism isolated from the infection.

Design: Retrospective.

Setting: Integrated Soft Tissue Infection Services clinic.

Patients: All patients treated from July 19, 2000, to August 1, 2001, who underwent surgical drainage of a soft tissue infection and had microbiological culture results.

Main Outcome Measures: Documented resolution of the infection with drainage of the abscess and antibiotic therapy alone was deemed a cure. An infection resulting in death or other surgical therapy was deemed a failure. Therapy was appropriate when the organism was sensitive to prescribed antibiotics and was inappropriate when the organism was insensitive.

Results: The study included 376 patients with 450 infections. *Staphylococcus aureus* as the primary organism was isolated from 441 of the cultures. Methicillin sodium–sensitive *S aureus* and methicillin-resistant *S aureus* were found in 157 and 284 of these isolates, respectively. Appropriate antibiotics were prescribed in 153 infections with methicillin-sensitive *S aureus* and in 25 with methicillin-resistant *S aureus*. Of 441 episodes, 408 were clinically evaluated for cure. Three patients failed treatment, 2 in the appropriately treated group (resulting in death and amputation) and 1 patient with osteomyelitis in the inappropriately treated group. The cure rate for infections treated appropriately or inappropriately was the same.

Conclusions: Treatment of soft tissue infections after surgical drainage, even with inappropriate antibiotics, has a high cure rate. Further studies to evaluate the efficacy of treating these infections without antibiotics are needed.

Arch Surg. 2006;141:850-856

The routine use of antibiotics in patients with soft tissue infections may be inappropriate. Results of recent studies1,2 suggest that some soft tissue infections resolve without antibiotic treatment. Other recent studies3,4 indicate that soft tissue infections treated by surgical drainage resolve even when treated with antibiotics not active against the primary organism found in the infection. While intriguing, none of these studies reported enough data to conclude that routine use of antibiotics was ineffective and inappropriate.

The increased incidence of soft tissue infections with antibiotic-resistant pathogens has led to renewed interest in determining whether antibiotics help cure the infection or increase the types of antibiotic-resistant organisms. *Staphylococcus aureus* is the most common organism cultured in soft tissue infections, and its resistance to antibiotics is on the rise, as seen with β-lactam antibiotics, causing increasing problems for treatment of methicillin sodium–resistant *S aureus* (MRSA).6 The spread of MRSA has been implicated not only in patients who are hospitalized or in long-term care facilities7,8 but also in our communities among injection drug users, prisoners, and children.10-12 The worldwide prevalence of MRSA among community-acquired soft tissue infections seems to be increasing rapidly.11-17 The increased incidence of soft tissue infections with antibiotic-resistant pathogens has led to renewed interest in determining whether antibiotics help cure the infection or increase the types of antibiotic-resistant organisms. *Staphylococcus aureus* is the most common organism cultured in soft tissue infections, and its resistance to antibiotics is on the rise, as seen with β-lactam antibiotics, causing increasing problems for treatment of methicillin sodium–resistant *S aureus* (MRSA).6 The spread of MRSA has been implicated not only in patients who are hospitalized or in long-term care facilities7,8 but also in our communities among injection drug users, prisoners, and children.10-12 The worldwide prevalence of MRSA among community-acquired soft tissue infections seems to be increasing rapidly.11-17 The increased incidence of soft tissue infections with antibiotic-resistant pathogens has led to renewed interest in determining whether antibiotics help cure the infection or increase the types of antibiotic-resistant organisms. *Staphylococcus aureus* is the most common organism cultured in soft tissue infections, and its resistance to antibiotics is on the rise, as seen with β-lactam antibiotics, causing increasing problems for treatment of methicillin sodium–resistant *S aureus* (MRSA).6 The spread of MRSA has been implicated not only in patients who are hospitalized or in long-term care facilities7,8 but also in our communities among injection drug users, prisoners, and children.10-12 The worldwide prevalence of MRSA among community-acquired soft tissue infections seems to be increasing rapidly.11-17

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such a trial has several obstacles. The standard of care has been to treat all infections with antibiotics. Most physicians believe that treatment with antibiotics is critical to limiting the spread of soft tissue infections. The standard of using antibiotics for these infections has led to ethical concerns that the use of a placebo in a study may jeopardize the health of the participants. In addition, patients expect to receive antibiotics for infections. The trading and sale of antibiotics among injection drug users indicate their perceived value of antibiotics in treating infections (D. Ciccarone, MD; oral communication, October 10, 2001). Therefore, it is important to justify a placebo trial based on the best retrospective data that can be obtained.

Preliminary data to justify a placebo-controlled trial partially come from retrospective observations that the cure rate for abscesses treated by surgical drainage is high and that infections with MRSA seem to respond even when the antibiotic received by the patient is not active against MRSA. The Integrated Soft Tissue Infection Services (ISIS) clinic at San Francisco General Hospital, San Francisco, Calif, is a specialized center established to treat the large number of soft tissue infections found in the medically underserved inner-city population of San Francisco on a walk-in basis. The clinic offers a unique opportunity to observe the natural history of soft tissue infections among a large cohort of patients in a longitudinal fashion. Therefore, data collected from the ISIS cohort were used to determine retrospectively whether antibiotics were needed to treat these infections. Information from this study could help justify a more rigorous clinical trial using a placebo medication.

METHODS

PATIENT SELECTION

The ISIS clinic, with the goal of providing compassionate, efficient, and cost-effective care to all patients with soft tissue infections within San Francisco (California) County, has been in operation since July 2000. In addition to rendering timely medical care, the clinic was designed to provide access to other relevant services, including wound care, selected social services, and substance abuse counseling and treatment. The clinic is open daily on a walk-in, first-come first-served basis and is staffed by academic faculty surgeons, licensed nurses, a substance abuse counselor, a social worker, and an administrative support person. The retrospective analysis of the ISIS cohort reported herein includes the 1-year period from July 19, 2000, to August 1, 2001. The ISIS database was reviewed for patient demographics, surgical procedures, microbiological studies, and antibiotics prescribed for the infections.

APPROPRIATE ANTIBIOTIC THERAPY AND CURE DEFINITION

Appropriate antibiotic therapy was defined as a bacterial isolate sensitive to the prescribed antibiotic, whereas inappropriate antibiotic therapy was defined as treatment of an isolate insensitive to the prescribed antibiotic. Cure was defined as resolution of the infection after initial incision and drainage and antibiotic therapy, whereas failure was defined as persistence of the infection after similar measures, requiring further major treatment. Examples include osteomyelitis, amputation, patient death, and severe soft tissue infection requiring major operative debridement, as in the case of necrotizing fasciitis. Medical records of patients were reviewed to assess not only the follow-up status for cure of this cohort but also complications associated with any admission related to the infection requiring major intervention.

MICROBIOLOGICAL CULTURES AND SUSCEPTIBILITY TESTING

Surveillance cultures were obtained from patients in the ISIS clinic undergoing procedures for drainage of abscesses for the microbiological profiling. The intact skin over the abscess was cleansed with povidone-iodine (Betadine) before incision or debridement. A sterile Dacron swab was rotated within the cavity immediately after surgical incision. Swabs were then sent to the San Francisco General Hospital clinical microbiology laboratory for routine aerobic and anaerobic culture and antimicrobial susceptibility testing. Incubation of trays and determination of minimum inhibitory concentration were performed using the Microscan Walkaway instrument (DAD International, West Sacramento, Calif). Guidelines of the National Committee on Clinical Laboratory Standards were used throughout to assess susceptibility. We reviewed all culture data during the study period.

Research using human subjects was approved by the University of California, San Francisco Committee on Human Research. Yates correction (\( \chi^2 \) test with continuity correction) was used to test for significant associations between categorical variables.

RESULTS

Microbiological cultures are not routinely obtained for patients undergoing incision and drainage at the ISIS clinic. To ascertain the microbiological profiles of patients within this population, surveillance cultures obtained from a subgroup and from 450 consecutive cultures that contained \( S \) aureus in 376 patients were retrospectively analyzed. We eliminated 9 cultures that were mixtures of \( S \) aureus and numerous other organisms, leaving 441 \( S \) aureus–positive cultures. Of these, 284 cultures (64.4%) contained MRSA, while 157 cultures (35.6%) contained methicillin-sensitive \( S \) aureus (MSSA).

In a subgroup of 272 patients from this cohort with available demographic data, injection drug use was reported in 157 patients (57.7%). One hundred nine (69.4%) of the injection drug users who had an \( S \) aureus infection had MRSA, accounting for 109 (61.6%) of 177 MRSA-positive cultures. Only 48 (50.5%) of 95 patients with MSSA-positive cultures reported injection drug use (Table 1). The likelihood of fever (temperature >38.0°C) on presentation to the clinic was similar between the 2 groups, with 13 (7.3%) of the MRSA population and 6 (6.3%) of the MSSA population initially seen with fevers. Among the sub sample of 207 patients with viral serologic data, 45.9% had human immunodeficiency virus or hepatitis C infection as a result of their injection drug use and personal habits. Injection drug users were more likely than nonusers to have MRSA. The mean area of abscesses with surrounding cellulitis was 25 cm², and the mean amount of pus drained from each abscess was 15 mL.
Reviewing the antibiotic treatment for 441 cultures containing *S. aureus*, 263 (59.6%) were treated inappropriately (Table 2), with treatment with a *β*-lactam antibiotic accounting for 253 (62.2%) of these cases. There were 259 (91.2%) of 284 episodes with MRSA isolates that were inappropriately treated with antibiotics, including 238 treated with cephalexin hydrochloride, 14 with a combination of amoxicillin–clavulanate potassium (Augmentin), 5 with levofloxacin, 1 with clindamycin hydrochloride, and 1 with erythromycin stearate. In contrast, when MSSA was the recovered isolate, only 4 (2.5%) of 157 patients were inappropriately treated with antibiotics, 2 with metronidazole hydrochloride (Flagyl), 1 with clindamycin, and 1 with penicillin V potassium (Pen-Vee K). The sensitivity pattern of MRSA to antibiotics in this population was 100% to sulfamethoxazole–trimethoprim (Bactrim), 96% to clindamycin, 94% to levofloxacin, and 46% to erythromycin. The 25 appropriately treated cases of MRSA were treated with levofloxacin (16 cases), ciprofloxacin hydrochloride (3 cases), clindamycin (3 cases), a combination of sulfamethoxazole–trimethoprim (Septra) (2 cases), and rifampin (1 case).

The medical records revealed that 92.5% (408 cases) of the treatment episodes had a follow-up longer than 2 weeks, with a mean follow-up of 2 months after treatment to determine whether the soft tissue infection had resolved. Overall, 241 (99.6%) of 242 inappropriately treated *S. aureus* infections had full resolution and cure of the infection after incision and drainage. This was statistically similar to the cure rate of the appropriately treated *S. aureus* infections (164 [98.8%] of 166 episodes) (χ² = 0.11, P = .74). We performed a sensitivity analysis that included the individuals who could not be evaluated for cure (21 patients [8.0%] in the inappropriately treated group and 12 patients [6.7%] in the appropriately treated group) and who were assumed to represent failures in the inappropriately treated group to determine differences in the cure rates between the 2 groups. In this analysis, the cure rate in the inappropriately treated group dropped to 91.6%, which is statistically significantly different from the 98.9% cure rate in the appropriately treated group (χ² = 10.8, P = .001).

There was only 1 failure related to the treatment of an infection with inappropriate antibiotics in the ISIS cohort. The patient developed necrotizing fasciitis and required an above-knee amputation. The group of patients receiving appropriate antibiotics had 2 failures. One occurred in a patient who received appropriate antibiotics for an MSSA soft tissue infection of bilateral thighs, but a necrotizing infection ensued, resulting in death. The other failure was in a patient who received appropriate antibiotics for an MRSA infection who developed osteomyelitis in the lower leg.

### REPORT OF CASES

#### CASE 1

A 42-year-old woman with a history of injection drug abuse and hepatitis C infection was seen following 24 hours of increased swelling and redness over her left buttock after injecting drugs into the site (Figure 1). Her temperature was 37.8°C. She was treated with 300 mg of oral clindamycin 3 times daily for 5 days, after an allergic reaction to penicillin after incision and drainage.

![Figure 1. A soft tissue infection of the buttock after heroin injection (patient 1).](https://example.com/figure1.png)
in the ISIS clinic. Cultures were obtained and yielded MSSA sensitive to clindamycin. She had a successful outcome after incision and drainage and appropriate antibiotic treatment.

CASE 2

A 37-year-old male injection drug user with hepatitis C infection had left deltoid swelling and redness for several days after injecting heroin into the area 1 week before he was initially seen (Figure 2). His temperature was 36.9°C. An 8 x 8-cm area of fluctuance was identified and treated with incision and drainage. Necrotic tissue was removed along with 20 mL of pus. He was discharged home from the ISIS clinic taking a regimen of 500 mg of oral cephalexin 4 times daily for 5 days. Cultures eventually yielded MRSA sensitive to ciprofloxacin, clindamycin, and levofloxacin. He also had a successful outcome, despite inappropriate antibiotic treatment after abscess incision and drainage.

CASE 3

A 50-year-old man who had injected heroin in both thighs was initially seen with a right thigh abscess that was drained in the ISIS clinic (Figure 3). His temperature was 36.3°C, his blood pressure was 97/61 mm Hg, his pulse was 80 beats/min, and his white blood cell count was 19 x 10^3 cells/µL. He was admitted to the hospital and treated with intravenous cefazolin sodium. He developed bilateral necrotizing fasciitis of the thighs. Cultures yielded MSSA. He died of cardiovascular collapse 1 day after his admission to the hospital. Despite appropriate antibiotic therapy, he was deemed a treatment failure.

COMMENT

The use of antibiotics to treat patients with soft tissue infections is problematic. The dramatic increase in infections caused by organisms resistant to many different antibiotics complicates the choice of antibiotics to treat these infections. Newer and different antibiotic regimens have been proposed to treat the epidemic of MRSA seen in community-acquired soft tissue infections. The use of these newer antibiotics will probably lead to the isolation of new organisms resistant to these antibiotics. The use of antibiotics among patients such as those seen in the ISIS clinic creates a tremendous burden on the health care system. The cost of the antibiotics, as well as the treatment of the adverse effects associated with the use of these antibiotics, is substantial. It is unknown whether the antibiotic therapy is even needed to cure these infections.

For soft tissue infections containing a drainable abscess, our data indicate that treatment with antibiotics may be unnecessary. Staphylococcus aureus is the most common organism cultured in the ISIS clinic, and MRSA is recovered in almost two thirds of these infections. Despite the rise in the number of patients infected with MRSA, most patients are treated with a β-lactam antibiotic with minimal activity against MRSA. Nevertheless, treatment of these patients with an antibiotic not active against the organism isolated from the infection results in the same high cure rate as that obtained in patients receiving antibiotics that are active against the isolated organism. The sensitivity analysis (described in the next to the last paragraph of the “Methods” section) reveals an unlikely difference in the adjusted cure rate between the 2 groups, as the San Francisco General Hospital is usually the only option for treatment of these patients when complications arise.

Several weaknesses in our study make it difficult to conclude that antibiotics are unnecessary for the treatment of these soft tissue infections. First, it is possible that an antibiotic such as cephalexin may have biological activity in infections in which only MRSA is isolated. The soft tissue infection, especially in the area of surrounding erythema, may contain organisms sensitive to the cephalosporin that are not identified by the microbiological culture. Second, because this study was retrospective, there is no way to determine whether the choice of antibiotics and the treatment recommendations for the study population were confounded by factors beyond our recognition. Third, the low treatment
failure rate in our cohort may be due to low virulence strains of community-acquired MRSA with high levels of susceptibility to a combination of sulfamethoxazole-trimethoprim, clindamycin, and levofoxacin. Studies have demonstrated that there are differences between community-acquired and hospital-acquired MRSA infections and that community-acquired MRSA infections are usually mild and responsive to multiple classes of non-β-lactam antibiotics. Fourth, the determination of cure or failure was done by retrospective medical record analysis. Although there was a high rate of success in finding medical record evidence that a particular infection was adequately treated or not, we could not be certain that patients did not receive other treatments outside of the health care system of San Francisco General Hospital. Some patients treated for MRSA with cephalaxin in our study might have obtained other antibiotics from other health care providers in the community. For these reasons, a randomized placebo-controlled trial is necessary to determine whether antibiotics are effective in the treatment of soft tissue infections.

The main objective of this study was to justify the need for a blinded, prospective, randomized, placebo-controlled study to determine whether antibiotics improve the outcome of soft tissue infections. To date, no convincing studies have been reported in the literature comparing the results of antibiotics vs placebo in this setting, to our knowledge. The acceptable method to determine the efficacy of any antibiotic in soft tissue infections is a comparison between 2 antibiotics without a placebo arm. The inclusion of a placebo control arm is controversial because of the possible adverse outcomes associated with uncontrolled infections. Data presented herein at least raise the point that misdirected antibiotic therapy does not seem to harm patients. The high cure rate in these types of soft tissue infections, even with inappropriate antibiotic therapy, suggests that treatment of these infections without antibiotics may be possible. The conduct of such a trial is indicated. Findings from such a study could decrease adverse drug reactions, minimize antibiotic use, slow down the spread of bacterial resistance against antibiotics, and reduce health care costs in our communities.

Accepted for Publication: May 3, 2006.

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Author Contribution: Dr Charlebois was the validating statistician for the study.

Previous Presentation: This study was presented at the 77th Annual Meeting of the Pacific Coast Surgical Association; February 20, 2006; Dana Point, Calif; and is published after peer review and revision. The discussions that follow this article are based on the originally submitted manuscript and not the revised manuscript.

REFERENCES


William P. Schecter, MD, San Francisco, Calif: There are 3 mechanisms of defense against bacterial invasion: the skin and mucosa barrier, the inflammatory response, and the immune response. When a bacterium such as S aureus penetrates the skin via a needle puncture or wound, the inflammatory response is initiated by a complex interaction of proteins in the clotting cascade and the cytokine cascade, causing vasodilatation, loosening of cell-cell junctions, and recruitment of leukocytes to the area of injury. Some cytokines, such as interleukins, activate the immune cells, allowing leukocytes to recognize bacterial antigen, bind to it, and present the bacteria to other immune cells that may secrete specific antibodies to bind to the bacteria or ingest and destroy them.

When a limited invasion of bacteria occurs, the inflammatory and immune responses may be sufficient to destroy the bacteria and prevent a clinically significant infection. However, when an area is overwhelmed by bacterial invasion, immune cells, including killer white cells, flood the area in an attempt to localize the infection, a process termed suppuration. If successful, the dead cells, bacteria, and tissue debris will form a thick white pus that points, hopefully, toward the skin and either necessitates draining or is drained, often resulting in resolution of the infection and wound healing.

Failure to localize the bacterial invasion results in a red halo surrounding the wound, which the Greeks called cellulitis. Further advance of the local infection results in localized tissue death, which the Greeks called melasmos (or blackening) and we term gangrene (or necrotizing soft tissue infection). Nineteenth-century surgeons were relieved to find thick white pus, so-called laudable pus, in the wounds and feared the appearance of thin brown watery wound drainage, which heralded uncontrolled infection usually resulting in the death of their patients. The discovery of antibiotics in the 20th century made it possible to rescue many of these patients.

Dr Paydar and his colleagues have retrospectively demonstrated that 99% of 450 infections in 376 patients treated in the ISIS clinic at the San Francisco General Hospital were caused by S aureus. They further demonstrated that 64% of these infections were caused by MRSA. Only 9% of MRSA infections were treated with antibiotics to which the organisms were sensitive, compared with 97% of MSSA infections. Yet remarkably, the cure rate, the complication rate, and the mortality rate were the same for both groups, suggesting that the presence of laudable pus indicates that the infection is localized and that antibiotic therapy in addition to drainage is unnecessary.

This no small point, as the widespread use and abuse of antibiotics have led to the emergence of antibiotic-resistant strains of bacteria, which threaten to neutralize our antibiotic options, as well as add a huge additional cost to health care. While limiting the use of antibiotics may be good for society, the physician at the bedside must place the interests of his patient first. Anyone who has seen a soft tissue infection patient die of a necrotizing infection or develop endocarditis may be reluctant to withhold antibiotics without confirmation of the results of this study by a randomized prospective trial demonstrating efficacy and safety. This is an important paper because it provides evidence to support the institution of such a trial. The senior authors of this paper, Drs Harris and Young, are to be congratulated for their vision in establishing this clinic and scientifically addressing a problem of great significance.

I have 3 questions for the authors: (1) Are you withholding antibiotics from abscess patients after drainage at the present time? (2) If so, what are your indications for withholding antibiotics? (3) Do you plan a prospective randomized trial to confirm these findings?

Robert C. Lim, Jr, MD, Hillsborough, Calif: I noticed that one third of these patients are HIV positive, and I was wondering if the authors would comment on the results of this subset of patients and if their treatment was any different.

Dr Young: Thank you very much for your questions and comments. Just for background information, the reason we actually instituted this study was to convince the IRB at UCSF [institutional review board at University of California, San Francisco] to allow us to try a placebo-controlled trial in this patient population. Initially, our IRB denied approval, saying that there was really no basis for treating these patients with a placebo. The standard of practice is the treatment of these patients with antibiotics. So, this study was done retrospectively to give us some ammunition to go before the IRB. With this, we actually were able to get approval for a placebo-controlled, prospective randomized trial.

Regarding Dr Schecter's question about whether we treat patients in the clinic without antibiotics, we still use antibiotics because without the blinded randomized trial, it is impossible to know that cephalexin actually does not have activity in the infection. Just because we are culturing MRSA from the wound does not exclude the presence of other bacterial isolates that we are not culturing. The cephalexin may be active against these other organisms. The cephalexin merely treats some organisms and allows the patient's immune system to overcome the remaining infection. So, we do not know for certain whether the cephalexin does have a therapeutic effect in these infections with resistant organisms in the culture results. Again, this is without data from the placebo-controlled trial.

Are there factors that would influence our selection of patients to treat or not to treat? Certainly there are, but in this retrospective analysis we actually do not know what criteria were used by the physicians in choosing which antibiotic. We do not know what the treatments ordered by the physicians were directed toward. So in this retrospective analysis, it is a weakness that we could not address.

Finally, regarding the question whether the placebo-controlled trial is going to be done, actually it was done. The results were finished prior to our submission of this abstract, and we are hoping to present that at a different meeting. But the bottom line is that, in a double-blinded, randomized, prospective, placebo-controlled trial, there is no difference between the use of antibiotics and the use of a pill that was a placebo. So, the answer to whether these patients should be treated or not treated is that they should not be treated, but whether that is something that we can institute as a policy within the hospital setting is unclear. Dr Schecter alluded to the fact that we, as physicians, must regard every patient individually and choose whether or not to treat. In all cases, it is safer to treat infections with antibiotics rather than without. It is only on a

Christian de Virgilio, MD, Torrance, Calif: One of the Achilles' heels of soft tissue infection is trying to distinguish, in an IV drug abuser, between an abscess and necrotizing fasciitis, so I am concerned about the potential for misdiagnosis. We have actually performed 2 studies in an effort to distinguish between necrotizing soft tissue infections and simple abscesses. In one study, we compared 28 patients with necrotizing fasciitis with more than 300 who had a simple soft tissue infection. What we found was that a decreased serum sodium level below 135 mEq/L or an elevated white blood cell count above 14·5 ·10^9/L was a predictor of an increased risk of necrotizing soft tissue infection. I noticed that the patient described with necrotizing fasciitis had a very high white blood cell count. My question is what steps have you taken to try to prevent misdiagnosing patients who may have a necrotizing soft tissue infection, and have you looked at the serum sodium level and white blood cell count to try to make that determination?
large-scale institutional basis that it makes sense not to treat these patients with antibiotics. Thus, it is a difficult but necessary policy decision to withhold antibiotic treatment in these cases.

But that gets us to the point made by Dr de Virgilio as to whether we can pinpoint the patients that do have necrotizing soft tissue infections that require treatment— with this other group that has laudable pus that does not require treatment. The truth is we actually do have some ability to identify these patients with necrotizing life-threatening infections, but it is not 100%. So, we are always left with that doubt that, if a patient may have a necrotizing soft tissue infection, we may be mistreating the patient. The point he made about misdiagnosis of the patient with necrotizing infection within the study—that patient actually was not misdiagnosed. That patient was diagnosed with necrotizing soft tissue infection, admitted to the hospital, and treated with IV antibiotics. He died despite the fact that he was diagnosed with it. We did not exclude him from the study because he was one of the cultures that we obtained from incision and drainage of the patient’s abscess. But this case highlights the problem of withholding antibiotics in someone who may have a life-threatening infection that could be misdiagnosed.

As far as the question of looking at serum sodium level and white blood cell count, we do not routinely look at the serum sodium level, but we do routinely look at the white blood cell count in patients that we admit with possible necrotizing soft tissue infections. We have observed, as everyone else has, that their white blood cell count is usually extremely elevated. It certainly is elevated beyond the $14 \times 10^3/\mu L$ point.

Finally, regarding Dr Lim’s question about the HIV status of these patients and whether they are treated differently, one third of our patients are HIV positive. The physicians in the ISIS clinic do not discriminate between HIV positivity and negativity in our selection of antibiotics. However, it is certainly the community standard that patients who have HIV infection are given more antibiotics than those who are HIV negative. Our prospective trial was not powered to look at the effect of HIV infections, so we cannot make a statement about that. But we hope to do so in a future study.

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**Announcement**

The editorial staff of the *Archives of Surgery* would like to announce a new section titled The Residents’ Corner. The main objectives of this section are to encourage residents to prepare peer-reviewed manuscripts, allow residents to critically evaluate manuscripts by their peers, and encourage residents to read and review manuscripts in surgical journals. At the time of submission to The Residents’ Corner, the first author must be a resident in training. The submission must be accompanied by a letter or e-mail from the resident’s program director verifying that the resident is in good standing. We encourage the submission of short articles limited to 1000 words and no more than 3 figures. A narrative abstract of no more than 135 words should be included. We will consider any appropriate short article, but envision the submission of interesting case reports, small case series, historical reviews, summaries of recent developments in surgery, and laboratory studies.

The review process will be supervised by the editorial staff of the *Archives of Surgery* and coordinated by two Resident Editors, Jayme Locke, MD, and Jordan Winter, MD. We will request peer reviews from other residents nationally and globally. When submitting articles for this section, please select The Residents’ Corner as the manuscript type in our online peer review and submission system. We look forward to this exciting new section and to the training of our younger colleagues.

Richard D. Schulick, MD
Deputy Editor