Should I prescribe antibiotics after draining an abscess in a young child? Should I pack his wound? Do I prescribe decolonizing measures?

You are asked to admit a previously healthy 15-month-old male with an abscess on his right buttock. The induration and erythema are about 5 and 7 cm respectively, and his maximum temperature has been 100F. His older brother has had two similar abscesses.

How would you approach this patient? Incision and drainage are clearly indicated, but what about antibiotics? Should the wound be packed? Should the child be decolonized? How?

Classically, antibiotics have not been prescribed once an abscess has been drained; however, with the emergence of community associated MRSA (CA-MRSA) many have advocated antibiotics. There is also the concern for a cellulitic component to these processes in children. Two recent studies have addressed this question in pediatric populations. In a randomized, double-blind, controlled trial, Chen et al. compared clindamycin to cephalaxin, assuming that clindamycin would be superior because of its efficacy against CA-MRSA. The primary outcome was clinical improvement at 48 to 72 hours, and the secondary outcome was resolution at 7 days. Participants were 6 months to 18 years old who presented to the ER with an abscess, furuncle, or carbuncle in which outpatient management was expected, and received a 7-day course of either cephalaxin (40mg/kg/day divided three times a day) or clindamycin (20mg/kg/day divided three times a day). Indeed, 69% of the patients had MRSA cultured from their wounds. By 48 to 72 hours, 94% of subjects in the cephalaxin arm and 97% of patients in the clindamycin arm were improved (p = 0.50). There was no association between gender, size of erythema or induration, location, or type of drainage procedure on primary outcome. There was a significantly lower rate of improvement at 48 to 72 hours among participants aged < 1 year (p = 0.004) and those with fever (p = 0.03). In addition, only baseline fever was associated with a significantly lower rate of resolution at 7 days.

The other recent trial of antibiotics for uncomplicated skin abscesses compared trimethoprim-sulfa to placebo. Interestingly, this was a non-inferiority trial, with trimethoprim-sulfa as the control arm and placebo as the experimental arm. The authors felt this was appropriate, as they considered antibiotics for MRSA abscesses to be the standard of care. The study suffered from being underpowered secondary to under-anticipating drop out, as well as possible selection bias as a large proportion of potential patients were not enrolled. There was poor
compliance with the study medication and exclusion of children with a temperature > 101°F as well. There was no reported advantage to antibiotics for the primary outcome (resolution at 10 days), though there was a higher rate of development of new lesions (>5 cm away from the initial abscess) in the placebo group at 10 days.

The only study to address packing had no sample size or power calculations as it was a pilot study. While the patients were not blinded, they were randomized to receive standard care plus or minus packing. The primary outcome measure was a need for intervention as determined by a blinded physician at 48 hours. They also measured pain. They enrolled 48 patients, 23 were randomized to the packing group. Wound cultures were positive for MRSA in 60.4%. There was no significant difference in need for further intervention between the packed (4 of 23 subjects) and nonpacked (5 of 25 subjects), p = 0.72. Post procedural pain scores were significantly higher in the packed group (p=0.014) in the immediate post-procedure period and at the 48 hour follow-up (p=0.03). The packed group also took more oxycodeone (p=0.03).

What about nasal decolonization with mupirocin? Faden et al. enrolled 60 consecutive children with S. aureus skin infections requiring drainage and 90 controls. They cultured the nares and rectum and characterized the isolates with genetic and susceptibility testing. S. aureus was detected significantly more often in the rectum of children with abscesses (47%) compared to controls (1%, p=0.0001). Rates of nasal colonization with S. aureus were equivalent for children with abscesses (27%) and controls (20%; p=0.33). S. aureus from the rectum was identical to the S. aureus in the abscess in 88% of cases, compared to 75% of nasal isolates. While not addressing the optimal mode or efficacy of decolonization, this article suggests that rectal decolonization (as opposed to nasal decolonization) is paramount.

So what’s a confused hospitalist to do? Since the child in the vignette is older than a year of age and does not have significant fever, he may not need antibiotics. Packing is probably unnecessary, and if decolonization is desired, a regimen which includes rectal decolonization, e.g. bleach baths, should be offered.

References

Should I routinely prescribe antibiotic prophylaxis at discharge after UTI?

Brian Alverson, MD

You are a hospitalist managing an otherwise healthy 4-month-old male with a first febrile urinary tract infection (UTI). The patient has mild hydronephrosis on ultrasound. Do you initiate urinary tract infection prophylaxis at discharge?

This question plagues the minds of many hospitalists, who may take a different viewpoint than urologists or primary care doctors regarding the utility of this action. Until recently, at least five studies had pointed to a lack of utility for antibiotic prophylaxis in UTI, but studies had been small, or weren’t blinded, or used routine screening as a sign of efficacy (which might have picked up asymptomatic bacteriuria). In 2009, Craig and his colleagues published the first article demonstrating the benefits for UTI prophylaxis.1 But on closer inspection, the magnitude of the benefits may not change many opinions.

Authors recruited patients from four Australian Centers in the years 1998-2007, including any children in the study who were under 18 years of age and who had at least one UTI which was symptomatic and culture positive. They included all patients regardless of degree of VUR, but did not require imaging of the renal tract for inclusion. From almost 10,000 patients who met criteria, they recruited 756 patients who also did not have underlying predisposing illness for UTI (such as neurogenic bladder) or in whom the prophylaxis antibiotic, trimethoprim-sulfamethoxazole (TMP-SMX) was contraindicated.
These patients were then randomized to a year of daily TMP-SMX or placebo. Authors collected demographic data, and also followed patients every 3 months to see if they were appropriately dosed and adherent to medication based on volume of medicine in the bottles. The primary studied outcome was the frequency of symptomatic UTI in the 12 months after initiation of the prophylaxis or placebo, with secondary outcomes including hospitalization and changes in DMSA scan (in those who volunteered to get one).

As one would imagine, with such a large randomized trial, there were no baseline statistical differences between the two groups. While the rate of compliance was the same in the two groups, the overall dropout rate was 30%, with about half of the dropouts falling out of the study in the first 3 months.

In the end, the authors found an absolute risk reduction of 6%. That meant that 13% of patients on prophylaxis had a symptomatic UTI, compared to 19% on placebo. This difference was statistically significant. But did it matter? Calculated another way, patients required an estimated 5,100 doses of TMP-SMX to prevent a single UTI in a year. Furthermore, authors noted that while patients on prophylaxis had fewer UTIs, the UTI’s they did have were more likely to be caused by a resistant organism (confirming Dr. Conway’s prior report). Additionally, among the patients who voluntarily had a DMSA scan performed, prophylaxis had no impact on the rates of improved, unchanged, or worsened DMSA scans after therapy.

The authors concluded that prophylaxis has a moderate impact on likelihood of UTI recurrence in children. However, it is up to us to decide if all those doses of antibiotics are worth the minimal prevention they provide, and the lack of impact on scarring they seem to confer.

References

**IV antibiotics in febrile UTI: how long is long enough?**

Michael Burke, MD

*Your 3-week-old patient with a febrile UTI has lost her IV on the third of seven planned days of IV therapy. Her parents have had enough and want to take the baby home. Can you comply with the parents’ wishes, spare the baby another IV and send her home on oral medications?*

Maybe so.

Previous randomized controlled trials of IV versus oral therapy for febrile UTI have shown no difference in outcomes including duration of fever, incidence of long term renal scarring and recurrent infection. However, neither study included children less than one month of age and neither described large numbers of infants from 4-to-8 weeks of age.

A more recent study may help to answer the question. In a large retrospective study of infants less than six months old who were hospitalized with UTI over a 5-year period ending in 2004, Brady et al., compared treatment failure (readmission for UTI within 30 days of discharge) in patients treated with short course (< 3 days) vs. long course (≥ 4 days) IV antibiotics before conversion to oral therapy. The authors gathered administrative data from 24 children’s hospitals on over 12,300 infants hospitalized with UTI as a primary or secondary diagnosis. Patients were excluded for chronic disease and likely catheter-associated UTI. The authors also excluded patients who received IV antibiotics for 14 or more days and those who died during the hospitalization, both considered markers for illness too severe to manage with oral therapy.

The authors hypothesized that they would find wide variability in duration of IV antibiotics, reflecting a lack of clear guidelines for management of young babies with UTI. And that is what they found. When they compared practices by hospital they found that the proportion of infants treated with long course IV antibiotics ranged from 15% to 87%. Individual babies were more likely to receive long course IV treatment if they were male, had bacteremia, were less than one month old, were Black or Hispanic, or not covered by a private health insurance plan. Patients with known urinary abnormalities were also more likely to receive four or more days of antibiotics IV.
Severity of illness at admission and presence of known abnormalities of the urinary tract were associated with increased risk of readmission for UTI. However, duration of IV therapy was not associated with risk of readmission, when controlled for the above risk factors. Within a month of discharge 1.9% of the children were readmitted for UTI; 1.6% of those treated with short course antibiotics versus 2.2% of those who received four or more days of IV treatment (Odds ratio of 1.02, 95% confidence interval 0.77 to 1.35). In subgroup analysis, this lack of association was maintained in children less than 4 months and children 5-to-6 months old. However, analysis of 4-to-5-month-old infants showed an unexplained increase likelihood of readmission in babies who received four of more days of IV therapy.

The bottom line: We are inconsistent in choosing duration of IV therapy in febrile infants with UTI and, for most patients, the duration doesn’t make a difference, at least in treatment failure causing readmission.

This is not a perfect study. It is retrospective and based on hospital administrative data, data that is one step removed from clinical outcomes. The outcome measure, readmission, is a blunt and imperfect measure, one that would miss patients with treatment failure that did not require hospitalization as well as those who were readmitted to a second hospital. More subtle markers of outcome, including duration of fever and frequency of renal scarring can’t be evaluated using this administrative data.

However, this study does show that, at least by one measure of outcome, short course IV therapy for UTI is as good as longer course IV therapy. Together with prior prospective trials, this study offers evidence for a shorter course of IV treatment, even in your youngest patients. Evidence that severity of illness at onset and presence of urinary anomalies increase risk of recurrence may support a more conservative approach in these babies.

References

Should I avoid steroids in wheezing patients whom I suspect also have bacterial pneumonia?
Brian Alverson, MD

A five-year-old child with a history of viral-induced wheeze is admitted to your service with a clear left-lower-lobe infiltrate. You start ampicillin, and you note that the child is wheezing as well. You give a trial of albuterol and notice improvement of the wheeze. Would you start steroids?

Investigators tried to address this important question in their article published in 2011 in Pediatrics. To put some significant numbers behind their analysis, they utilized the PHIS database, a billing-code-centered database with at least 38 contributing children’s hospitals from around the United States. They queried the 2006-2007 portion of the database for diagnoses of pneumonia in children ages 1 through 18 years of age who received antibiotics on the first day of hospitalization. They excluded patients with underlying chronic disease. From this set of patients they assessed length of stay in the hospital and readmission rates, and stratified for two major variables: whether they received systemic steroids, and whether they received a beta-agonist. The authors assumed active wheezing in patients if a beta-agonist was prescribed during the pneumonia hospitalization.

Overall, this large database revealed over 20,000 patients who satisfied inclusion criteria into the study. Out of this patient group, 7,234 received systemic steroids and 13,469 received no systemic steroids. There were some baseline differences between these two groups. Teenagers with pneumonia were less likely than younger children to get steroids. Also, children who got steroids tended to be a bit sicker, as determined by an increased likelihood of going to the ICU. Not surprisingly, children getting steroids were also more likely to have been hospitalized with asthma in the past. There were also some differences between patients based on labs (for example, patients getting steroids were more likely to have ABGs done, were more likely to be ventilated, but were less
likely to have a CBC or electrolytes performed). Obviously, patients on steroids were more likely to get beta-agonists as therapy.

There were large differences in rates of steroids being given to patients by the hospitals studied. On average, 32% of patients received steroids. However, hospital-specific rates of steroid use ranged from 1% to 51%. But what was most remarkable about this paper is what the authors found regarding length of stay after controlling for 14 measured variables with a multivariable analysis. Patients who were wheezing went home sooner if they got steroids. However, patients who were not receiving beta-agonists stayed in the hospital longer if they got steroids. Also, their likelihood of readmission was higher in the following month. The results implied what one might expect: pneumonia patients who wheeze need steroids, but if they don’t wheeze, steroids may prolong their length of stay in the hospital and increase bounce-back rates. These results are unique in that while many have assumed that steroids may be harmful in the face of bacterial disease by inhibiting immune response, this hasn’t previously been borne out in the literature. There were many potential problems with this retrospective study. However, it is an interesting first attempt to sort out a highly clinically relevant question for hospitalists.

References