Empiric antibiotics – just in case
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Story from the front lines

A man in his 30s with a history of intravenous drug use presented to the emergency department after he "…was aiming for the vein but missed."

On arrival, he was noted to be afebrile but with mild tachycardia (heart rate 102). A directed history revealed a young man who had injected heroin into his left upper arm. The cleanliness of the needle was unknown. He was not taking any regular medications and was noted to have a penicillin allergy (skin rash). Mild erythema and discomfort was noted around the injection site, but there was no fluctuance, induration, or discharge. He was discharged with a 7-day prescription of trimethoprim-sulfamethoxazole (TMP-SMX) for presumed cellulitis.

Six days later, he returned to the emergency department with one day of headache, fever (102 degrees), and diffuse erythematous rash over his trunk and extremities. His blood pressure was in the 80s/50s, and he was urgently started on fluids and broad-spectrum IV antibiotics. Labs were remarkable for elevated transaminases, elevated creatinine, and mild eosinophilia. Out of concern for sepsis, the work up included blood cultures, a urinalysis, head/chest imaging, and a lumbar puncture. Blood pressures remained low despite initial fluid resuscitation, so a central venous catheter was attempted and he was admitted to the intensive care unit. Fortunately, his blood pressures improved without the need for pressor medications. A review of his clinical picture at this time led the admitting team to include a reaction to TMP-SMX on the differential diagnosis for his distributive shock.

By the following morning, the patient remained hemodynamically stable. His rash was still present but receding. After 48 hours of incubation, there was no growth of any organisms in the blood or other body fluid. Infectious disease consultants agreed with the primary team's suspicion of drug reaction with eosinophilia and systemic symptoms, or DRESS, syndrome.

Teachable moment

Persons who inject drugs (PWID) are clearly at increased risk of bacterial infections. In a cross sectional study of PWID in San Francisco, 32% of participants had abscesses or cellulitis, and the risk of abscess was 4.9-fold higher if the participant "skin-popped" [1]. With regards to abscess treatment, there have been several small studies that have shown no benefit to systemic antibiotics when added to adequate drainage [2]. A more recent trial with improved statistical power did show a benefit of relatively high dose TMP-SMX for clinical cure at 7 to 14 days, with an absolute risk difference of about 7% compared to placebo [3].

However, it must be emphasized that these data apply only to observed infections, not simply needle stick "injuries" as was the case with this young man. He ultimately suffered direct – though unintentional – harm from his initial antibiotic prescription. He was also subjected to a repeat emergency department visit, an intensive care admission, invasive procedures, and exposure to additional antibiotics.

But did the potential benefit of expectantly treating a possible infection outweigh the potential harms? Unfortunately no clear guidelines exist for this scenario.

One similar topic is antimicrobial prophylaxis, which is given frequently in some circumstances such as bite wounds, dental work, and surgical procedures. However, Enzler et al. state clearly in their review of prophylaxis: "[it] should be limited to specific, well-accepted indications to avoid excess cost, toxicity, and antimicrobial resistance" [4].

While problems such as antimicrobial resistance and C. difficile secondary infections have been well publicized, many direct effects of antibiotics remain underappreciated. For TMP-SMX, some toxicities can include hemolytic anemia, thrombocytopenia, hyperkalemia, and dermatologic reactions including DRESS, which confers up to a 10% mortality rate [5].

For this gentleman, he was participating in a high-risk behavior. In fact, he may have developed an abscess had he not received TMP-SMX initially, and with additional risk stratification this may have been a clearer choice. Yet given the information available – a lack of convincing objective data for a true infection, his intact immune status (no HIV or diabetes), and the lack of clear treatment guidelines – it would have been reasonable to withhold antibiotics.

This case underscores the importance of shared decision making with the patient. For antibiotics in ambiguous situations like these, the provider should communicate clearly that although the *indication* is not well established, the potential *risks* certainly are. The patient may feel quite strongly about aggressive prevention, or they may be quite content with calm reassurance and the knowledge that prompt care will still be available should their condition worsen.

References:

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