Asymptomatic Bacteriuria, What Are You Treating?

Jennifer Weiskopf, MD

Story from the Front Lines

A man in his 80s with a history of interstitial lung disease, DVT on warfarin, and chronic venous stasis came to the emergency department (ED) with swelling of his bilateral lower extremities. He had no other symptoms. A urinalysis was obtained which demonstrated pyuria and positive leukocyte esterase. His urine was sent for culture and in the meantime he was given a dose of ceftriaxone for a presumed urinary tract infection (UTI). He was subsequently admitted for concern of right-sided heart failure complicating his chronic venous stasis.

Teachable Moment

Bacteriuria is defined in men as more than $10^5$ colony forming units of the same organism isolated on one uncontaminated urine sample and in women as two samples with the same parameters.\(^1\) To be classified as asymptomatic bacteriuria (ABU) the above requirements must be met in a patient exhibiting no genitourinary symptoms.\(^2\)

Screening and treatment of ABU has been supported in certain subsets of patients. In pregnant women, for example, screening and treatment reduces rates of pyelonephritis in the mother as well as preterm delivery and low-birth weight.\(^1\) There is also evidence that the risk of bacteremia is reduced by screening for ABU in patients undergoing urologic procedures with mucosal disruption, including transurethral resection of the prostate.\(^1\)

On the contrary, studies performed in other adult populations, including non-pregnant women, elderly men and women, and institutionalized patients with and without indwelling urinary catheters consistently demonstrate no benefit from antibiotic treatment of ABU and sometimes demonstrate harm.\(^2\) In a recent systematic review by Dull et al, patients with ABU had a slight increased risk of symptomatic urinary infection compared with non-bacteriuric controls, but treatment of the asymptomatic colonization did not reduce their risk of subsequent symptomatic infection.\(^5\) Further, there was no association of ABU with increased kidney dysfunction, hypertension, genitourinary malignancy, or mortality in these patients.\(^5\)

The increased risk of symptomatic UTI in ABU patients was likely due to host factors that support bacterial colonization rather than the current strain becoming virulent. Intervening in such cases with antibiotics only increases risk of progressively resistant infections with no clinical benefit.\(^5\) A recent prospective randomized control trial even indicated that presence of ABU can be protective. The population studied, sexually active young women, is slightly different than the focus of our discussion, but it nonetheless showed colonization by the less virulent strains that cause ABU can decrease the incidence of infection by more virulent strains via bacterial interference.\(^4\) Dull et al’s systematic review found a number needed to harm of 2-10, with adverse effects from antibiotics including increased resistance, superinfections, and clostridium difficile related complications.\(^5\)

Despite this compelling evidence and the guidelines from organizations including the Infectious Diseases Society of America and United States Preventive Services Task Force recommending against screening or treatment of ABU - except in pregnant women and prior to urologic procedures - screening and treatment of ABU remains a significant problem.\(^1,3\) Recent data show that between 26 and 68% of patients with ABU are treated with antimicrobial therapy.\(^5\) Considering that UTIs are the most common indication for antibiotics in the hospital, this has a significant impact, not only on the individual patient, but on antimicrobial resistance and rising costs in our health care system as a whole.

In the face of such clear guidance to the contrary, it is worth considering perhaps why so many patients with ABU still receive antibiotics. It is possible that clinicians fear potential adverse effects of not treating bacteriuria more than the known risks of antibiotics. Knowledge gaps regarding pre-test probability of infectious syndromes and laboratory interpretation is likely also a factor considering that UTIs are often diagnosed in the context of vague symptoms accompanying pyuria.
Our patient had no symptoms to suggest UTI and was not in a high-risk category necessitating intervention for his asymptomatic bacteriuria. In receiving ceftriaxone up front, the patient stood little to no chance of benefit but was exposed to greater risk for antimicrobial resistance, superinfection, and other complications from antibiotics.

References:


