

Approach to a Positive Urine Culture in a Patient Without Urinary Symptoms

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KEYWORDS

- Asymptomatic bacteriuria • Urinary tract infection • Antibacterial agents
- Guidelines implementation

KEY POINTS

- Asymptomatic bacteriuria (ASB) is defined by the presence of bacteria in an uncontaminated urine sample collected from a patient without signs or symptoms referable to the urinary tract.
- ASB is distinguished from symptomatic urinary tract infection by the absence of signs and symptoms of urinary tract infection or by determination that a nonurinary cause accounts for the patient's symptoms.
- ASB is a very common condition in diverse patient groups.
- Overtreatment of ASB with antibiotics is also very common, particularly in patients who are hospitalized, have urinary catheters, or live in a nursing home setting.
- Unnecessary antimicrobial treatment of ASB confers harm to the individual and to society.

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INTRODUCTION

Definition of Asymptomatic Bacteriuria

In most patient populations, interpretation of a positive urine culture depends on the presence or absence of associated symptoms. The definitions used in this review are those of the Infectious Diseases Society of America (IDSA) guidelines concerning asymptomatic bacteriuria (ASB) (2005) and catheter-associated urinary tract infection, or CAUTI (2010).^{1,2} In a patient without signs and symptoms of urinary origin, the presence of bacteria in a noncontaminated urine specimen is defined as ASB.³ In contrast, urinary tract infection (UTI) requires the presence of urinary-specific symptoms or signs in a patient who has both bacteriuria and no other identified source of infection.^{1,4} The definition of ASB requires isolation of the same organism in 2 consecutive voided urine specimens for women, one voided urine specimen for men, and, in addition, from a single urine specimen collected via urinary catheter in both sexes.² Neither the type of bacterial species isolated from the urine nor the presence of pyuria can be used to determine whether the patient has ASB or UTI. Available evidence supports screening for and treatment of ASB in pregnant women and in patients undergoing invasive urologic procedures.³ In most other patient groups, there is convincing evidence that neither screening nor treatment lead to improved clinical outcomes.³ Unnecessary antibiotics given to treat ASB can cause harm in terms of antibiotic resistance, adverse drug effects, and wasted expense.⁵

These definitions are hard to apply in clinical settings, particularly in the patient populations in which ASB is most common—catheterized patients, nursing home patients, and patients in intensive care units (ICUs). The lack of specific diagnostic tests to distinguish UTI from ASB means that the diagnosis of ASB entirely depends on clinical assessment of the patient's symptoms or lack thereof. Many hospitalized or institutionalized patients may be unable to express their symptoms, and nonurinary symptoms are often attributed to bacteriuria in such patients.^{6–8} Another challenge is that the diagnosis of ASB requires that the clinician ignore powerful stimuli for the use of antimicrobial agents, namely a positive urine culture result and pyuria. Other incorrect mental cues, such as reliance on urine color or urine odor, may also lead to misdiagnosis.⁹ Human microbiome studies are disproving the dictum that normal bladders are sterile,¹⁰ but the conviction that untreated bacteriuria will lead to harm persists.¹¹

This review focuses on the epidemiology of ASB and its clinical significance. The review covers appropriate management of ASB in various patient populations, delineating where evidence is not adequate to support recommendations and discussing what evidence is able to guide the clinician in these areas of uncertainty. Also summarized are the growing body of published interventions that have been used to prevent overtreatment of ASB. ASB in children is not addressed, because the pathogenesis differs from that of ASB in the adult.¹² Furthermore, this review does not discuss symptomatic UTI or acute cystitis, which requires treatment with antibiotics to relieve symptoms¹³ and can lead to pyelonephritis when untreated.¹⁴ Asymptomatic funguria, management of ASB in patients undergoing urologic surgery, and management of ASB in renal transplant patients are addressed in other articles in this issue. The overall purpose of this review is to promote an awareness of ASB as a distinct condition and to empower clinicians to withhold antibiotics in situations in which antimicrobial treatment of bacteriuria is not indicated.

EPIDEMIOLOGY AND SIGNIFICANCE OF ASB

ASB is Very Common

In 2008 the Centers for Disease Control and Prevention published new surveillance definitions for CAUTI to be used by the National Healthcare Safety Network, the United

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