

# Asymptomatic Bacteriuria in Noncatheterized Adults



Matthew Ferroni, MD, Aisha Khalali Taylor, MD\*

## KEYWORDS

- Asymptomatic bacteriuria • IDSA • Urinary tract infection • Translational barriers
- Antimicrobial overtreatment • Live biotherapeutics

## KEY POINTS

- Asymptomatic bacteriuria (ASB) is defined by the presence of bacteria in an uncontaminated urine specimen collected from a patient without signs or symptoms referable to the urinary tract.
- ASB is highly prevalent among women over the age of 60, hospitalized and institutionalized patients, ambulatory elderly patients, and patients with diabetes mellitus.
- The Infectious Diseases Society of America (IDSA) has recommended against screening for and treating ASB with antimicrobials unless patients are undergoing invasive genitourinary procedures or are pregnant. Despite these clear guidelines, there remains significant overtreatment of ASB with antimicrobials, particularly in patients who are hospitalized or live in a nursing home setting, leading to deleterious consequences in this vulnerable patient population.
- Microbiologic evidence exists to support not treating ASB secondary to reduced virulence factors associated with ASB strains and may suggest that ASB may be beneficial in reducing symptomatic lower urinary tract infections (UTIs) in certain patient populations.
- Translational barriers to the implementation of IDSA recommendations for the management of ASB have been identified and addressed to some degree. In an era in which clinicians' face pay for performance concerns with current practice patterns not reflecting evidence-based recommendations, attention needs to be focused on eliminating these translational barriers on a global scale.

## INTRODUCTION

### *Definition of Asymptomatic Bacteriuria and Infectious Diseases Society of America Recommendations*

ASB is defined as the presence of bacteria in a noncontaminated urine specimen obtained from a patient without signs and symptoms of UTI.<sup>1</sup> In asymptomatic women, the diagnosis of ASB requires the isolation of the same organism in 2 consecutive voided urine specimens isolated in quantitative count greater than or equal to 100,000 colony-forming units (CFUs). In asymptomatic

men, a single voided urine specimen with 1 bacterial species isolated in quantitative count greater than or equal to 100,000 CFUs/mL or a single catheterized specimen with 1 bacterial species isolated in quantitative count greater than or equal to 100 CFUs/mL in asymptomatic male or female patients constitutes the diagnosis of ASB (**Box 1**).<sup>2</sup> The significance of ASB and the effects of antimicrobial treatment on this condition are well established in some populations but remain unproved or uncertain in others.<sup>3</sup> In 2005, the IDSA published clear, evidence-based guidelines on the diagnosis and treatment of ASB in adults.<sup>2</sup> The only populations the IDSA

Department of Urology, University of Pittsburgh Medical Center, 300 Halket Street, Suite 4710, Pittsburgh, PA 15213, USA

\* Corresponding author.

E-mail addresses: [taylor10@upmc.edu](mailto:taylor10@upmc.edu); [aishakhalalitaylor@gmail.com](mailto:aishakhalalitaylor@gmail.com)

Urol Clin N Am 42 (2015) 537–545

<http://dx.doi.org/10.1016/j.ucl.2015.07.003>

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**Box 1****Diagnosis of asymptomatic bacteriuria**

Lack of signs and symptoms of UTI

Diagnosis based on urine specimen collected in manner that minimizes contamination

For asymptomatic men – single voided urine specimen with 1 bacterial species isolated in quantitative count  $\geq 100,000$  CFUs/mL

For asymptomatic women – 2 consecutive voided urine specimens with isolation of same bacterial strain in quantitative counts  $\geq 100,000$  CFUs/mL

For men or women – single catheterized urine specimen with one bacterial species isolated in quantitative count  $\geq 100$  CFUs/mL

Based on IDSA guidelines.

Data from Nicolle LE, Bradley S, Colgan R, et al. Infectious Disease Society of America Guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults. Clin Infect Dis 2005;40:643–54.

recommended for screening and treatment included pregnant patients to reduce the incidence of pyelonephritis and premature delivery and patients undergoing invasive genitourinary surgery to reduce the incidence of bacteremia and sepsis.<sup>4</sup> The IDSA strongly recommended against screening for ASB in premenopausal nonpregnant women, women with diabetes mellitus, hospitalized patients without UTI symptoms, ambulatory elderly adults, elderly institutionalized residents in long-term care facilities, patients with spinal cord injuries, or individuals with indwelling urethral catheters.<sup>2,3</sup> Despite these available clear guidelines from the IDSA, clinicians continue to misdiagnose and inappropriately manage ASB.<sup>5–10</sup> This article reviews the following:

- A review of the epidemiology and risk factors for ASB
- A review of the literature encompassing the management of ASB in patients with diabetes mellitus
- The basic science of ASB
- A discussion of translational barriers to the application of the IDSA recommendations and approaches to reducing these barriers

## EPIDEMIOLOGY OF ASYMPTOMATIC BACTERIURIA

ASB is common among elderly patients in the community, patients in long-term care facilities, and patients in the hospital setting.<sup>11</sup> The prevalence of ASB increases with age, ranging from 0% in men aged 68 to 79 up to 5.4% in men aged 90 to 103.<sup>12</sup> The prevalence of ASB among women is even more pronounced, increasing from 13.6% among women aged 68 to 79 to 22.4% in among women aged 90 to 103.<sup>13</sup> ASB is more common in institutionalized patients, with

greater functional impairment compared with community dwellers (25%–50% of women and 15%–35% of men in institutionalized care).<sup>11,14</sup> In healthy young premenopausal nonpregnant women, the prevalence of ASB is 1% to 5%.<sup>15</sup> In hospitalized elderly patients, the prevalence of ASB is 32% to 50% among women and 30% to 34% among men.<sup>12</sup> Among community-dwelling older women, the predominant etiologic pathogens of ASB include *Escherichia coli* (51.4%), *Klebsiella pneumoniae* (4.1%), *Proteus mirabilis* (3.3%), and *Enterococcus faecalis* (2.5%) (Fig. 1).<sup>16</sup> Among institutionalized patients and patients with long-term indwelling urinary catheters, polymicrobial bacteriuria is common, often including *Pseudomonas aeruginosa*, *Morganella morganii*, and *Providencia stuartii*.<sup>2,17</sup> Risk factors for ASB include older age, female gender, higher postvoid residuals in men, and genetic factors in certain women (Table 1).<sup>15</sup> Whether diabetes itself creates a predisposition to ASB is not entirely clear. A single-center study in 511

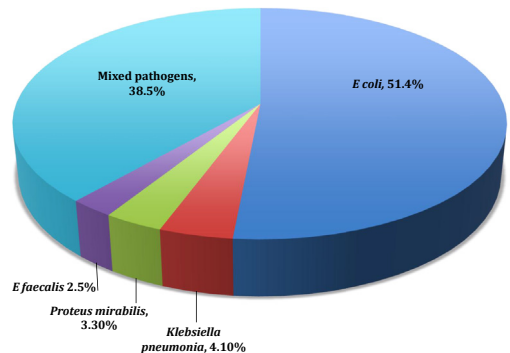


Fig. 1. Prevalence rates of bacterial pathogens among community-dwelling women with ASB.

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