Reducing Antibiotic Overuse: A Call for a National Performance Measure for Not Treating Asymptomatic Bacteriuria

Peter A. Gross1 and Brijesh Patel2

1Department of Medicine, Hackensack University Medical Center, Hackensack, and 2University of Medicine and Dentistry of New Jersey—New Jersey Medical School, Newark, New Jersey

Positive urinary tract culture results often represent asymptomatic bacteriuria, which does not need to be treated with antimicrobial agents. Avoiding treatment of asymptomatic bacteriuria in adults should reduce the risk of development of antibiotic resistance and is consistent with the Infectious Diseases Society of America and US Preventive Services Task Force guidelines on bacteriuria. A similar approach for not treating upper respiratory illnesses with antibiotics was initiated by the Centers for Disease Control and Prevention. We propose that a hospital and ambulatory performance measure should be developed for not treating asymptomatic bacteriuria in adults. In addition, such an effort would aid hospitals in confronting the proposal of the Centers for Medicare and Medicaid Services (to be implemented in 2009) to not pay the expenses associated with catheter-associated urinary tract infection.

Urinary tract infection (UTI) is one of the most common infections in adults in both acute care and long-term care facilities. In general, UTI is the health care–related infection that is associated with the lowest mortality [1]. A positive urine culture result may indicate pyelonephritis, cystitis, or asymptomatic bacteriuria (ASB) [2]. Occasionally, a positive urine culture result is associated with sepsis.

ASB in adults does not have to be treated [2]. Exceptions occur when the patient is pregnant or when the urinary tract will be surgically manipulated. The presence of a bladder catheter in the absence of signs of sepsis may be a clue for the presence of ASB.

Concluding that a positive urine culture result represents significant bacteriuria depends on the clinical context. Advanced age, dementia, and immunodeficiency syndromes may prevent the development of a febrile response or leukocytosis in instances in which the positive urine culture result represents a significant infection. The presence of delirium, urinary retention or incontinence, metabolic acidosis, and respiratory alkalosis in this group of patients and in patients who are not able to communicate may be additional clues to the presence of significant infection in such contexts. Consequently, pyuria and bacteriuria alone do not represent a disease but are signs that must be considered in the context of other signs and symptoms present in the patient.

Guidelines published by the Infectious Disease Society of America (IDSA) in 2005 state that there is no measurable benefit to screen for or provide antibiotic treatment of ASB in the following patients: premenopausal women who are not pregnant, patients with diabetes, older patients living in the community and in long-term care facilities, and patients with spinal cord injury or indwelling bladder catheters [2]. Screening and treatment is appropriate for women during pregnancy and for patients who have a positive urine culture result prior to surgical manipulation of the urinary tract to avoid precipitating sepsis. The US Preventive Services Task Force has published recommendations similar to those of the IDSA [3].

According to the IDSA guidelines [2], for asymptomatic women, ASB is defined as isolation of the same strain in quantitative counts of 10 × 5 CFU/mL in 2 consecutive clean-catch voided urine specimens; for asymptomatic men, ASB is defined as isolation of a single strain in quantitative counts of 10 × 5 CFU/mL in a single clean-catch voided urine specimen. Alternatively, for an asymptomatic person, ASB is defined as a single catheterized urine specimen, with the isolation of a single strain in a quantitative count of 10 × 2 colony-forming units per mL.

The guidelines also mention that antimicrobial therapy is often unsuccessful in
eradicating the microorganism and may, in fact, result in the selection of more-resistant microorganisms, such as extended-spectrum β-lactamase–resistant bacteria, vancomycin-resistant enterococci, and other multidrug-resistant bacteria [4]. In addition, treatment of patients will subject them to the risk of an allergic reaction, diarrhea, and other adverse reactions resulting from use of the antimicrobial drug. Finally, Clostridium difficile infection may develop, because the bowel flora is altered when treating ASB.

Prospective, observational studies performed in Spain and Australia [5, 6] indicated that ASB is the major risk factor for the development of complications, such as symptomatic UTI (including sepsis), in diabetic patients. However, a placebo-controlled, double blind, prospective clinical trial [7] performed in the United States that involved diabetic women failed to conclude that treatment of ASB reduces such complications. On the basis of IDSA guidelines, screening for or treatment of ASB in diabetic patients is generally not beneficial and, therefore, is not recommended.

Other than during pregnancy and urinary tract manipulation, absence of treatment of ASB has not been associated with adverse outcomes. Randomized, controlled trials have confirmed the lack of harm from not treating ASB [8, 9]. In fact, some of the randomized, controlled trials have revealed a lower long-term mortality rate among patients who have not been treated for ASB [10].

Not only long-term urinary catheter use, but also short-term catheter use predisposes an individual to bacteriuria and, subsequently, to UTI with or without bacteremia. On the basis of a randomized, controlled trial [11], antibacterial therapy of ASB associated with short-term catheter use has been suggested to prevent subsequent UTIs. However, data from a study by Garibaldi et al. [12, 13] indicate that the cost-effectiveness of this approach is questionable, because the risk of symptomatic UTI among this group of patients is very low. Also, IDSA guidelines do not recommend this approach.

The incorrect management of ASB is a worldwide problem. The Scottish Intercollegiate Guidelines Network, among others, has evaluated the issue thoroughly and has concluded that ASB is a benign disorder for which treatment is not indicated [14]. There have been a number of prospective randomized and nonrandomized clinical trials [15–17] conducted globally to determine the morbidity and mortality associated with ASB. In a study from The Netherlands, Meiland et al. [18] concluded that women with type 1 or 2 diabetes and ASB did not have an increased risk for a faster decrease in renal function or the development of hypertension during 6 years of follow-up.

Successful efforts have reduced the use of antimicrobial drugs to treat upper respiratory illnesses in outpatients [19]. It is now necessary to promote a similar approach for ASB in inpatients and outpatients. Although guidelines on ASB have been written, guidelines usually do not have the desired effect on therapeutic management [20, 21]. Some of the reasons for the failure of guidelines to regularly guide treatment are that guidelines are too long and contain recommendations of varying quality; some recommendations are based on randomized, controlled trials, and others are based on the lowest level of evidence (i.e., expert opinion) [22]; guidelines usually contain too many recommendations; and different societies write guidelines on the same subject and provide slightly different recommendations. Studies of guidelines typically show that guidelines do not change physician behavior. Most efforts expended for implementing guidelines rely on didactic teaching sessions, which have been shown to have little impact [23]. Other methods, such as audit and feedback, as well as reminders, would be expected to be more successful but are infrequently used.

The creation of performance measures adapted from evidence-based recommendations in guidelines has been shown to affect a change in behavior. The measures are selected on the basis of convincing levels of evidence, such as repeated randomized, controlled trials. When such performance measures are adopted by the Centers for Medicare and Medicaid Services and the Joint Commission on the Accreditation of Healthcare Organizations as standards of care, the desired effect of improved processes and outcomes of care can be achieved [24, 25].

The format for a performance measure with regard to not treating ASB in adults could be as follows: in adults with ASB (according to the criteria in the IDSA guidelines), no treatment should be initiated if (1) the patient is afebrile and has no signs or symptoms of sepsis, such as hypotension or delirium; (2) the patient is not pregnant; and (3) the patient will not undergo urinary tract instrumentation in the near future. In addition, for patients with indwelling bladder catheters, this performance measure could be combined with other performance measures that address (1) the indications for initial bladder catheter insertion [26–28], (2) using aseptic technique and hand washing when inserting the catheter [29], (3) securing the catheter to avoid pulling on the bladder trigone, (4) maintaining a closed system, and (5) early removal of the bladder catheter (within 3–4 days). All of these measures should be combined to form the “urinary catheter bundle.”

Although this approach makes the effort more complex, it results in a more comprehensive method for preventing the overuse of indwelling bladder catheters and antimicrobial agents. Supporting the implementation of a urinary tract bundle is the fact that urinary catheter use in older hospitalized patients who do not have a specific medical indication is associated with a 2-fold increase in mortality [30].

The benefits and risks of antibiotic therapy for ASB in certain group of patients, such as transplant recipients, patients with renal stones and ASB, and neutropenic patients, are less clear, and no recommendations are indicated in the IDSA guide-
lines with regard to screening for or treatment of ASB in these patients. Clinical judgment should be emphasized in such contexts.

Therefore, as an initial effort, we recommend that a performance measure be developed that discourages the treatment of ASB in adults and that the measure be adopted as part of a urinary catheter bundle by the Centers for Medicare and Medicaid Services and the Joint Commission on the Accreditation of Healthcare Organizations as a quality standard for which all clinicians should comply. This would result in the reduction of indiscriminate use of antimicrobial therapy and of the appearance of multidrug-resistant organisms. This measure should be adopted in pay-for-performance and pay-for-participation programs and should be part of the standards used in hospital accreditation. This proposal will aid hospitals in confronting the proposal of the Centers for Medicare and Medicaid Services (to be finalized for 2008) not to provide payments for management of hospital-acquired, catheter-associated UTI [31]. The measure is also consistent with the Centers for Disease Control and Prevention “step 8,” which indicates not treating antimicrobial colonization to prevent antimicrobial resistance among hospitalized adults [32].

Acknowledgments

We thank Dr. Dennis S. O’Leary and Dr. Jerod M. Loeb (The Joint Commission) for their suggestions.

Financial support. The Institute for Clinical Innovation through an unrestricted grant from Becton Dickinson and the Frost Outcomes Research Fund.

References