Does Nonpayment for Hospital-Acquired Catheter-Associated Urinary Tract Infections Lead to Overtesting and Increased Antimicrobial Prescribing?


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Background. On 1 October 2008, in an attempt to stimulate efforts to prevent catheter-associated urinary tract infections (CAUTI), the Centers for Medicare & Medicaid Services (CMS) implemented a policy of not reimbursing hospitals for hospital-acquired CAUTI. Since any urinary tract infection present on admission would not fall under this initiative, concern has been raised that the policy may encourage more testing for and treatment of asymptomatic bacteruria.

Methods. We conducted a retrospective multicenter cohort study with time series analysis of all adults admitted to the hospital 16 months before and 16 months after policy implementation among participating Society for Healthcare Epidemiology of America Research Network hospitals. Our outcomes were frequency of urine culture on admission and antimicrobial use.

Results. A total of 39 hospitals from 22 states submitted data on 2,362,742 admissions. In 35 hospitals affected by the CMS policy, the median frequency of urine culture performance did not change after CMS policy implementation (19.2% during the prepolicy period vs 19.3% during the postpolicy period). The rate of change in urine culture performance increased minimally during the prepolicy period (0.5% per month) and decreased slightly during the postpolicy period (~0.25% per month; P < 0.001). In the subset of 10 hospitals providing antimicrobial use data, the median frequency of fluoroquinolone antimicrobial use did not change substantially (14.6% during the prepolicy period vs 14.0% during the postpolicy period). The rate of change in fluoroquinolone use increased during the prepolicy period (1.26% per month) and decreased during the postpolicy period (~0.60% per month; P < 0.001).

Conclusions. We found no evidence that CMS nonpayment policy resulted in overtesting to screen for and document a diagnosis of urinary tract infection as present on admission.

Catheter-associated urinary tract infection (CAUTI) is the most common healthcare-associated infection in the United States [1]. On 1 October 2008, the Centers for Medicare & Medicaid Services (CMS) stopped reimbursing hospitals for treatment of hospital-acquired CAUTI and other hospital-acquired conditions they deemed were “reasonably preventable” [1]. Since then,
hospitals only receive reimbursement if a urinary tract infection was demonstrated to have been present at the time the patient was admitted to the hospital (rather than acquired during hospitalization) [2]. There is a debate over whether this policy will decrease the frequency of CAUTI or whether it may create perverse incentives for hospitals to document asymptomatic bacteriuria at the time of admission and inappropriately treat them as urinary tract infections, to avoid loss of payment if a CAUTI is diagnosed after admission. Although the policy explicitly applies to reimbursement for CAUTI, documentation of any urinary tract infection at admission would increase reimbursement. As described in a recent editorial, “if, as a result of the rule change, clinicians were pressured to test the urine of all patients on admission to the hospital, the risk of unnecessary treatment of asymptomatic bacteriuria or inflammation would be substantial” [3]. Past CMS policy designed to improve management of pneumonia has had the unintended consequence of antibiotic overuse [4].

Several groups of patients commonly have bacteria in their urine without any symptoms of infection (ie, asymptomatic bacteriuria) and do not benefit from antimicrobials [5]. For these patients, the possibility of overperformance of urine culture at admission as a screening tool to detect and document urinary tract infection as being present on admission, and thereby avoid possible nonpayment, is real and concerning [6]. Urinary tract infection is a diagnosis based largely on clinical symptoms, with the support of nonspecific laboratory tests such as urinalysis and urine culture [6, 7]. Patients with urinary catheters are particularly prone to bacteriuria and pyuria, which would fulfill the criteria for CAUTI in the appropriate clinical setting of fever, pain, tenderness, or other nonspecific criteria [7]. Given that fever and abdominal pain are often caused by other conditions, culturing urine more frequently would be expected to yield an increased frequency of urinary tract infection diagnoses, even if symptoms in patients receiving the diagnosis were best explained by another clinical syndrome. This increase in false-positive diagnoses of urinary tract infection at admission would be expected to increase inappropriate use of antimicrobials for patients with a diagnosis of urinary tract infection, resulting in potential increases in bacterial resistance, Clostridium difficile infections, and adverse drug reactions over time. Our aim was to thus evaluate whether implementation of the CMS policy of nonreimbursement for hospital-acquired CAUTI was temporally associated with increased frequency of urine culture on hospital admission. As a secondary outcome, we examined whether implementation of the CMS policy was associated with increased use of antimicrobials commonly used for the treatment of urinary tract infection.

**METHODS**

This study was completed using the Society for Healthcare Epidemiology of America (SHEA) Research Network, a consortium of >200 hospitals that has successfully conducted multicenter research projects in healthcare epidemiology [8, 9]. An invitation to participate in the current study was sent to all SHEA Research Network members. This study received institutional review board (IRB) approval with a waiver of informed consent and a HIPAA waiver from the coordinating center, the University of Maryland School of Medicine, as well as from IRBs at all individual sites.

**Data**

The CMS nonpayment policy took effect on 1 October 2008. Data were obtained for all adult hospital admissions during a prepolicy period, from 1 June 2007 to 30 September 2008, and a postpolicy period, from 1 October 2008 to 28 February 2010. All hospitals provided daily retrospective data for the study period. To assess the primary outcome (ie, frequency of urine culture on admission after implementation of the CMS policy), variables collected included the daily number of admissions and the number of urine cultures performed in the first 48 hours after the date of admission (including 10 hours prior to admission, to capture urine cultures performed for patients in the emergency department). Urine cultures were assessed within the first 48 hours for 2 reasons: (1) samples requested from admission orders for urine culture may not be collected until up to 48 hours later, and (2) the Centers for Disease Control and Prevention (CDC) considers conditions diagnosed >48 hours after admission to be hospital-acquired conditions [10]. Data on the number of wound cultures performed in the first 48 hours after admission were also requested and reported. Wound cultures were chosen as a nonequivalent, dependent variable to identify changes in culturing practice not related to the CMS policy [11].

To evaluate the secondary outcome of antimicrobial use, we obtained retrospective data from a convenience subsample of hospitals with access to automated pharmacy data to obtain the number of patients who were prescribed antimicrobials that are often (although not exclusively) used for the treatment of urinary tract infection. Antimicrobials included fluoroquinolones, trimethoprim-sulfamethoxazole, cephalaxin, amoxicillin-clavulanate, and nitrofurantoin. Fluoroquinolone antimicrobials included ciprofloxacin, levofloxacin, moxifloxacin, and gatifloxacin. Other broad-spectrum antibiotics were not included, as these are more commonly used for other infections. We collected data on antimicrobial use in the first 72 hours after admission and, to better measure how often antimicrobials were being used for suspected urinary tract infection, determined the number of patients who had urine cultures...