RESEARCH LETTERS

LESS IS MORE

Preoperative Urine Cultures at a Veterans Affairs Medical Center

The value of preoperative urine screening is unproven, except before urologic procedures, in which detection and treatment of asymptomatic bacteriuria is beneficial.[1] Despite this, authors of multiple small case series advocate for screening before nonurologic procedures.[2-5] However, patients with detected bacteriuria may undergo further testing[6] and, if prescribed antimicrobial drugs, can develop diarrhea, allergic reactions, and *Clostridium difficile* infection (CDI).[7] In addition, treatment of bacteriuria can delay procedures and extend hospitalization. Accordingly, we reviewed the medical records of patients who underwent cardiothoracic, orthopedic, and vascular procedures to document (1) the frequency of preoperative culture (UC) use, (2) the frequency of consequent antimicrobial therapy, and (3) any effect of preoperative urine screening, or consequent antimicrobial therapy, on postoperative complications.

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Methods. We identified all cardiothoracic, orthopedic, and vascular surgical procedures performed during FY2010 at the Minneapolis VA Medical Center, and abstracted any UC order or result during the 7 days before each procedure. Bacteriuria was classified as high count (≥100 000 colony-forming units [CFU]/mL) or low count (10 000-90 000 CFU/mL). Cultures with fewer than 10 000 CFU/mL or no growth were considered negative for bacteriuria. Antimicrobial drugs for urinary tract infection (UTI) were recorded from 7 days before until 30 days after surgery, as were clinical manifestations or health care provider diagnoses of UTI. Assessed complications included allergy, diarrhea, CDI, and surgical site infection (SSI), as inferred from health care provider notes, polymerase chain reaction detection of CDI plus diarrhea, and application of Centers for Disease Control and Prevention SSI criteria.[8]

Results. Overall, 1934 procedures were performed in 1688 patients. Orthopedic procedures predominated (1291 in 1115 patients), followed by cardiothoracic procedures (331 in 314 patients) and vascular procedures (312 in 259 patients). Patients were predominantly male (96%), with a mean age of 61.8 years. Overall, 13% of procedures were followed by complications, most commonly SSI (8%), followed by diarrhea (3%), UTI (2%), and CDI and drug allergy (<1%).

A UC was obtained before 25% of procedures, with significant variation by service (cardiothoracic, 85%; vascular, 48%; orthopedic, 4%; $P<.001$), but not by procedure type. No patient had UTI manifestations. Bacteriuria was detected by 11% of UCs (54 of 489). Whereas detection of high-count bacteriuria (5% overall) varied by service (cardiothoracic, 1%; vascular, 8%; orthopedic, 13%; $P<.001$), detection of low-count bacteriuria (6% overall) did not (data not shown). Antimicrobial drugs were dispensed for preoperative UTI in 16 patients, for a median of 4 days (range, 1-14 days). Interestingly, 8 treated patients (50%) had only low-count bacteriuria or a negative test result for UC.

To identify correlates of preoperative UC use, patients with (n=489) and without (n=1445) preoperative UCs were compared. Screened patients were older (66.9 vs 60.0 years; $P<.001$), more frequently male (98% vs 95%; $P=.002$), and more likely to develop SSI (17% vs 4%; $P<.001$), diarrhea (6% vs 2%; $P<.001$), and CDI (0.6% vs 0%; $P=.02$).

Among patients with a preoperative UC, patients with bacteriuria (n=54) and those without (n=435) were compared for postoperative complications, both overall and in relation to antimicrobial therapy. Surgical site infection was similarly frequent among patients with bacteriurua vs those without (20% vs 16%; $P=.56$). In contrast, postoperative UTI was more frequent among patients with bacteriurua vs those without (9% vs 2%; $P=.01$) (**Table**). Rates of other complications (diarrhea, CDI, allergy) did not differ by UC result or bacteriuria treatment (data not shown).

Among 54 patients with a positive screening UC, treated and untreated patients were compared with identify possible benefits or harms of such treatment (Table). Paradoxically, a greater proportion of treated patients developed a SSI (45% vs 14%; $P = .03$). This effect was greatest among patients with high-count bacteriuria, with SSI occurring in 4 of 8 (50%) if treated vs 1 of 15 (7%) if untreated ($P = .03$). Postoperative UTI also was numerically more frequent among treated patients than untreated patients (18% vs 7%). Other complications did not vary in frequency with treatment (data not shown).

Table. Urine Culture (UC) and Associated Antimicrobial Treatment Prior to 1934 Surgical Procedures Among Veterans in FY 2010 in Relation to Rates of Postoperative Urinary Tract Infection (UTI) and Surgical Site Infection (SSI)

			No. (Row %)	
UC Status[a]	Antimicrobial Treatment	Procedures, No.	SSI	Postoperative UTI
No UC	No	1445	63 (4)	22 (2)
UC negative	No	430	70 (16)	8 (2)
	Yes	5	1 (20)	1 (20)
UC positive	No	43	6 (14)	3 (7)
	Yes	11	5 (45)	2 (18)

[a] No UC, no UC obtained; UC negative, UC with fewer than 10 000 colony-forming units (CFU)/mL or no growth; UC positive, UC with at least 10 000 CFU/mL.

Comment. We found that preoperative UCs were ordered inconsistently, that findings were rarely positive for bacteriuria, and that bacteriuria, when detected, usually was

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not treated. In addition, preoperative UCs were associated with higher rates of SSI, diarrhea, and CDI, whereas bacteriuria, although associated with health care provider–diagnosed postoperative UTI, was not associated with SSI. Because these associations are derived from small samples in an observational study, they should be interpreted cautiously, recognizing the potential for confounding. Similarly, the finding that treating bacteriuria was associated with SSI may be confounded by factors that contributed to the decision to administer antimicrobial drugs.

To our knowledge, this study provides the first systematic assessment of the frequency of preoperative UCs. Moreover, with nearly 2000 procedures, it is the largest study to assess outcomes associated with such testing. Our findings document that treatment of preoperative bacteriuria is associated with no benefit. These findings suggest that, outside the context of a randomized clinical trial, preoperative screening for and treatment of asymptomatic bacteriuria should be avoided in patients undergoing cardiovascular, orthopedic, or vascular surgery procedures.

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A Comparison of Care at E-visits and Physician Office Visits for Sinusitis and Urinary Tract Infection

Internet capabilities create the opportunity for e-visits, in which physicians and patients interact virtually instead of face-to-face. In e-visits, patients log into their secure personal health record internet portal and answer a series of questions about their condition. This written information is sent to the physicians, who make a diagnosis, order necessary care, put a note in the patients' electronic medical records, and reply to the patients via the secure portal within several hours. E-visits are offered by numerous health systems and are commonly reimbursed by health plans.[1,2] They typically focus on care for acute conditions, such as minor infections.

There are several potential advantages of e-visits, including convenience and efficiency (avoiding travel and time) and lower costs.[3] Furthermore, e-visits can be provided by the patient's primary care physician instead of a physician at an emergency department or urgent care center. The main concerns about e-visits center on quality issues: whether physicians can make accurate diagnoses without a face-to-face interview or physical examination,[4] whether the use of tests and follow-up visits is appropriate, and whether antibiotics might be overprescribed.

To our knowledge, no studies have characterized the differences between e-visits and office visits. To fill this knowledge gap, we compared the care at e-visits and office visits for 2 conditions: sinusitis and urinary tract infection (UTI).

Methods. We studied all e-visits and office visits at 4 primary care practices within the University of Pittsburgh Medical Center Health System, Pittsburgh, Pennsylvania. These practices were the first to offer e-visits, but they are now offered at all primary care office locations. The practices have a total of 63 internal medicine and family practice physicians. We identified all office visits and e-visits for sinusitis and UTI at these practices between January 1, 2010, and May 1, 2011. Structured data were obtained directly from the electronic medical records (EpicCare).

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