

## Pseudo-Outbreak of Oxa-23-Mediated Carbapenem-Resistant *Acinetobacter baumannii* in Urinary Tract Infections Caused by an Automated Urine Analyzer

*To the Editor*—*Acinetobacter baumannii* is a gram-negative coccobacilli, isolated from clinical and environmental sources,<sup>1</sup> that is mainly responsible for hospital-acquired pneumonia, catheter-related bacteremia, and urinary tract infections.<sup>2</sup> This emerging nosocomial pathogen has the ability to acquire various antibiotic resistance mechanisms, facilitating the emergence of multidrug-resistant strains that are able to persist in the hospital environment. OXA-23 is the most widespread  $\beta$ -lactamase with carbapenemase activity found in *A. baumannii* and has been frequently associated with outbreaks.<sup>3</sup> However, urinary tract infections caused by OXA-23-producing *A. baumannii* remain rare.

Here, we report a pseudo-outbreak of *A. baumannii* urinary tract infection involving 3 patients that was caused by an automated urine analyzer. On October 13, 2013, the infection control unit at our institution (Groupe Hospitalier Paris Saint Joseph, Paris, France) was notified of 3 imipenem-resistant *A. baumannii* isolated from urine samples of 3 patients. All isolates exhibited an identical phenotype with respect to antibiotic susceptibility. The French national reference center for detection of antimicrobial resistance (Besançon, France) confirmed the presence of the OXA-23 enzyme in 3 genetically related strains. The first patient was hospitalized in the otolaryngology ward and had a urinary catheter. The second patient has been admitted to the emergency department for a fever resulting from an alveolar-interstitial pneumonia. The third patient, notable for a diagnosis of spina bifida, experienced urinary retention. He was hospitalized for a laminectomy and had a urine sample with a positive culture of a susceptible *A. baumannii* obtained on October 8, 5 days before the pseudo outbreak. Review of the previous 3 months of microbiology records did not find any other imipenem-resistant *A. baumannii* strains. A thorough ward-based investigation revealed no epidemiological link to suggest cross-infection between the patients. During this period, there was no change in staff, microbiological technique, or culture medium. The identity label on each sample was checked to rule out potential human error.

Therefore, the investigation focused on the microbiology laboratory, especially on the flow cytometry-based UF-500i instrument<sup>4</sup> (bioMérieux) used for analysis of urine samples. This analyzer uses a single needle for sample aspiration that is washed by a rinsing system, which is designed to prevent sample-to-sample carryover in the bacterial count. Depending on the quantity of bacteria detected in the sample, an adequate number of rinsing cycles with buffer are performed. Finally, we found that the 3 samples were analyzed succes-

sively by the UF-500i. The UF-500i detected 2,461, 1,421, and 10 colony-forming units (CFU)/ $\mu$ L for the first, second, and third patient urine samples, respectively. Bacteria count was  $10^5$  CFU/mL for the first sample,  $10^4$  CFU/mL for the second, and  $10^3$  CFU/mL for the third. Occurrence of 3 consecutive samples harboring an imipenem-resistant *A. baumannii* suggested a contamination due to the analyzer needle. The urine samples were cultured again, which led to identical colony counts. New urine samples were requested to obtain control samples for each patient, and the first patient was the only one found to be infected with *A. baumannii*. He was affected by a catheter-related urinary tract infection due to an imipenem-resistant *A. baumannii* strain 3 days before. No evidence of contamination of the following samples was found at the time. Unexpectedly, attempts to reproduce the contamination were unsuccessful.

Occurrence of 3 patients with urinary tract infections due to an OXA-23-producing *A. baumannii* on the same day from 3 independent care units is an improbable event. In such a situation, a pseudo-outbreak should be suspected. Among 20 reported pseudo-outbreaks, Weinstein and Stamm<sup>5</sup> identified 7 that originated within the microbiology laboratory. Imipenem-resistant *A. baumannii* have already been reported in pseudo-outbreaks, but the origin was a false susceptibility testing by a rapid automated system.<sup>6</sup> Pseudo-outbreaks involving the same automated urine analyzer were only reported with *Pseudomonas aeruginosa*.<sup>7</sup>

To the best of our knowledge, this is the first description of a pseudo-outbreak of *A. baumannii* urinary tract infection caused by an automated urine analyzer. This pseudo-outbreak was due to inadequate decontamination of a sampling needle. The UF-500i analyzer does not use a disinfectant to sterilize the sampling needle between the samples but just rinses the needle with the washing buffer. *A. baumannii* creates biofilms on medical devices, such as urinary catheters.<sup>8</sup> A part of the preexisting biofilm could have been dropped in the urine sample and then drawn by the automated needle, leading to the partial failure of the washing process. Such an event could explain why attempts to reproduce the contamination were unsuccessful.

We focused on these cases because a multidrug-resistant strain was involved, but contamination involving susceptible bacteria may occur without being detected. Therefore, we recommend that urine samples be plated before being analyzed by the UF500i. If not, regular sterility control must be applied when bacterial cultures are performed after treatment of the sample by the UF-500i.

This pseudo-outbreak did not lead to antimicrobial therapy. Rapid identification of a pseudo-outbreak is particularly important to prevent the implementation of time-consuming and costly measures, such as patient isolation, microbiological analysis to detect secondary transmission, and inappropriate antimicrobial therapy. Infection control units as well as microbiologists should suspect a pseudo-outbreak if a cluster of

isolates of biofilm-forming and/or multidrug-resistant bacteria is observed in urine samples analyzed by a UF-500i.

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## Legionella Hospital Laboratory Testing Practices in Georgia

*To the Editor*—We read with interest the excellent article by Garrison et al<sup>1</sup> titled “On-Site Availability of *Legionella* Testing in Acute Care Hospitals, United States.” The authors’ call for more on-site testing for *Legionella* is of critical importance for patient care.<sup>2</sup> In addition, legionellosis is a nationally notifiable disease, and public health would benefit from rapid diagnosis as well as rapid reporting.<sup>3</sup> Increasing in incidence in the United States, Legionnaires’ disease is one of the leading causes of community-acquired pneumonia and requires a higher public health priority.<sup>4–8</sup>

An earlier study by Brzozowski et al<sup>9</sup> on diagnostic testing practices for infectious diseases supports the findings of Garrison et al.<sup>1</sup> Brzozowski and colleagues (R.L.B. is a coauthor) conducted a survey of hospital microbiology laboratories in Georgia to assess diagnostic testing practices in 2006 for selected infectious diseases, including *Legionella*. In that study, only 4 (11%) of 36 hospital laboratories that received a request for *Legionella* urine antigen testing reported the ability to perform the test on site.<sup>9</sup> Among 15 hospitals that received a request to culture, only 1 hospital laboratory reported culturing *Legionella* on site.<sup>9</sup> Of note, only 66% of the Georgia hospital laboratories reported receiving a request for any *Legionella* diagnostic testing in 2006. Urban hospitals were more likely than rural hospitals to receive requests for testing (on-site or send-out testing) for *Legionella* ( $P = .0002$ ).<sup>9</sup> Larger hospitals were significantly more likely than midsize or small hospitals (those with less than 100 beds) to receive requests to test for *Legionella* (either on-site or send-out testing;  $P = .001$ ).<sup>9</sup> Both Garrison et al<sup>1</sup> and Brzozowski et al<sup>9</sup> found that larger hospitals were more likely to offer on-site testing.<sup>1,9</sup>

Garrison et al<sup>1</sup> speculate that turnaround time is greater with send-out specimens, and this was supported by the Georgia study.<sup>9</sup> The median turnaround time for results for *Legionella* urine antigen from commercial laboratories was 3 days, in stark contrast to 0.75 days for on-site testing ( $P = .0073$ ).<sup>9</sup> We agree with Garrison et al<sup>1</sup> that turnaround time for results is a likely barrier to testing for legionellosis. Interestingly, the Georgia study found similar results for other rapid molecular tests with most specimens sent for off-site testing; for meningococcal polymerase chain reaction, the turnaround time for results of specimens sent to commercial laboratories was 2.5 days.<sup>9</sup>

Should hospitals be incentivized to provide on-site laboratory testing capacity, particularly as new rapid molecular tests are being developed and approved for use? Relevant professional organizations and advisory groups may want to review the issue. Certainly, the government and insurance companies should consider the cost to the patient and society when inadequate reimbursement practices hinder the use of diagnostic tests. Perhaps timeliness of reporting results should