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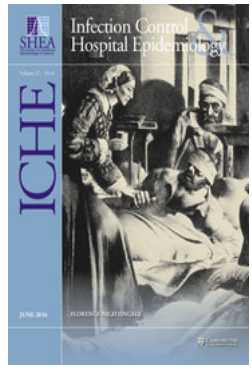

Prevalence of Asymptomatic Bacteriuria in Hospitalized Patients

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Although fosfomycin used to be primarily designated for urinary tract infection treatments, the lack of available antibiotics to treat carbapenemase producers has given fosfomycin an important adjuvant role, mainly in more severe infection cases. Despite that, according to results reported by Karageorgopoulos et al[5] as well as this present study where the emergence of fosfomycin resistance was reported just shortly after its introduction in clinical practices (mid-2014), fosfomycin resistance has become a concern because the endemic level reached by the KPC-2-Kp is due to its great ability to adapt and survive,[8,9] characteristics that came as an advantage mainly through antimicrobial selective pressure, strongly driven by the previous use, showing the need to establish a rigorous protocol for antimicrobial consumption.

The limitation of this study is due to the unknown genetic background information on which mechanism is involved to confer resistance to fosfomycin. So, further studies should be performed in order to detect possible genetic targets, such as *fos*A3 gene, that encode for a specific enzyme and which have recently resulted in a high resistance level to fosfomycin among European KPC-producers.[10]

In conclusion, this study reports a significant emergence of fosfomycin resistance among KPC-2-Kp isolates in a relatively short period after the introduction of this antibiotic as an effective agent to treat KPC infections. Strict control practices are urgently required in order to avoid the resistance rate increase, regardless of the mechanism by which it occurs.

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Prevalence of Asymptomatic Bacteriuria in Hospitalized Patients

To the Editor—The prevalence of asymptomatic bacteriuria (ASB) varies widely based on the studied population. Currently, the prevalence of ASB in patients hospitalized in acute care institutions is unknown. Awareness of the prevalence of ASB in this setting would be useful in both medical decision making as well as public reporting of hospital-acquired urinary tract infections. In this prevalence study, 200 randomly selected patients admitted in April/May 2013 to a tertiary care academic center had urine samples collected for culture within 24 hours of being admitted. Data from the medical records were collected during these hospitalizations up to 30 days post-enrollment. The objective was to determine the prevalence of ASB. Of the 200 patients, 17 were found to have ASB for a prevalence of 8.5%.

Because infections acquired during a hospital stay are not always reimbursed by insurers, knowing what conditions were present on admission can be relevant from the hospital's perspective. ASB, usually defined as 1 (in men) or 2 separate

(in women) urine samples with microbial growth above a certain threshold in the absence of typical urinary tract symptoms, is such a condition. While the prevalence of ASB in patients hospitalized in acute care institutions is currently unknown, it has been determined in other populations and ranges from 1% to 5% in healthy premenopausal women to 100% in long-term catheterized patients.[1] ASB should not routinely be screened for; however, if it is first detected during the hospital stay after a catheter is placed or during a fever, it can easily be misinterpreted as healthcare-associated.[2] ASB is not a treatment indication (with few exceptions) but inappropriate antibiotic administration for ASB is common and associated with higher occurrence of antibiotic-resistant bacteria generating a major opportunity for antimicrobial stewardship.[3,4] Our objective was to determine the prevalence of ASB among patients admitted to an academic medical center.

METHODS

We conducted a prevalence study from April 1 to May 31, 2013, and included 200 adult patients who were admitted to Barnes-Jewish Hospital, a 1,250-bed university-affiliated tertiary care center in St. Louis, Missouri, for a variety of reasons with the exception of a UTI diagnosis (or compatible symptoms). To apply inclusion and exclusion criteria, a convenience sample of 5–10 newly admitted patients were interviewed within 24 hours and asked for any urinary tract symptoms. Other exclusion criteria were fever ≥38°C of unknown etiology (because UTI could be part of the differential diagnosis) and patients unable to communicate their symptoms. After obtaining informed consent, a midstream clean-catch urine sample was collected in the same 24-hour time window and was evaluated for urinalysis using a dipstick test and routine culture. A positive urine culture was defined as a single urine sample with microbial growth of $>10^5$ colony-forming units of a single organism.[2] Data from the medical record were collected during the patient's hospitalization, ending 30 days post-enrollment (if the patient was still admitted at that point). We considered a sequence of 200 enrolled patients in the order of their admission to the hospital (without prior sample size calculation). The results were not shared with the treating physicians. The Washington University Institutional Review Board approved the study.

RESULTS

Of the 200 included patients, 110 were women (55%). The mean age was 47.8 years (±16.5). Most patients were white (112; 56%) or African-American (83; 41.5%). The admitting service was general medicine in 139 patients (69.5%) and neurology in 19 patients (9.5%), with comparatively fewer patients admitted to surgical services. In addition, 41 patients (20.5%) carried a diagnosis of diabetes mellitus. None of the patients had a urinary catheter in place on the day of admission.

TABLE 1. Urine Culture Results in 200 Patients Screened for Asymptomatic Bacteriuria Upon Admission

Urine Culture Results	No. (%)
Total samples	200 (100)
Clinically insignificant growth ($<10^5$ CFU)	102 (51.0)
Asymptomatic bacteriuria	17 (8.5)
Total organisms detected	18 (100)
Escherichia coli	4 (22)
Klebsiella pneumoniae	4 (22)
Streptococcus Group B	3 (17)
Coagulase-negative *Staphylococcus*	2 (11)
Enterococcus spp.	2 (11)
Lactobacillus spp.	1 (6)
Providencia rettgeri	1 (6)
Other Gram-negative bacilli	1 (6)

NOTE. CFU, colony-forming units.

Of the 200 patients, 17 (8.5%) were found to have ASB; all 17 were women. Another 102 (51%) patients had positive urine cultures but with insignificant growth according to the definition set forth above. The retrieved organisms are shown in Table 1. Comparing patients with ASB versus no ASB, there were no differences in age or race. Both the proportion of patients admitted to the ICU during their stay (1 patient of 17 patients [5.9%] with ASB vs 8 patients of 183 patients [4.4%] without ASB; $P = .7$) and the overall length of hospital stay (3 days [range, 2–10] vs 3 days [range, 2–34]; $P = .7$) were similar. Only 1 of the 200 patients was diagnosed with a UTI over the course of hospitalization, and 1 fatality occurred among the cohort; both of these occurred in the non-ASB group. During their hospital stays, 2 patients had a urinary catheter, and 14 of the 200 were receiving antimicrobials on admission (all in the non-ASB group). No ASB patient received therapy, as the culture results were not disclosed to treating physicians.

DISCUSSION

We found the prevalence of asymptomatic bacteriuria to be 8.5% in a general hospital population on the day of admission, with all affected patients being women and *Enterobacteriaceae* being the most common pathogen group. This rate is similar to data from other populations; however, to our knowledge, ASB prevalence has never been determined for acute care hospital admissions.[5–7] The significance of the 51% samples with growth in urine cultures below the threshold is unclear; none of them developed a symptomatic UTI while being admitted. When obtaining urine cultures in patients admitted to an acute care hospital, providers should be aware that approximately 1 in 10 may arrive with ASB.

Our study had several limitations. It was a single-center study, and enrolled patients were middle-aged adults admitted mostly to lower acuity wards under general medicine or neurology services. Thus, the findings are difficult to generalize. Regardless, when working up a possible infection over the

hospital course that would qualify as hospital-acquired, the possibility of ASB that was present on admission should be given consideration.

Given that a substantial number of patients receive unnecessary antibiotics while hospitalized, these results serve as a reminder that the clinical picture must not be forgotten when interpreting laboratory findings. This is particularly relevant for positive urine cultures, a common justification for starting antibiotics irrespective of symptoms.[8–10] Raising the awareness of ASB and its potential misinterpretation as nosocomial bacteriuria can lead to lower antibiotic consumption and thus decrease the development of antimicrobial resistance.

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