RESEARCH LETTER

Incidence and Prevalence of Multidrug-Resistant Acinetobacter Using Targeted Active Surveillance Cultures

To the Editor: Recent legislation mandates active surveillance cultures to detect multidrug-resistant (MDR) organisms in hospitalized patients. The active surveillance strategy has not been widely applied to MDR Acinetobacter, one of the most difficult gram-negative pathogens to control and treat. Universal active surveillance is resource-intensive and may divert resources from other infection control interventions. We conducted a prospective cohort study using universal active surveillance cultures to determine the prevalence and incidence of transmission of MDR Acinetobacter and to estimate the effects of targeting active surveillance to patients with recent exposure to a long-term care facility.

Methods. Universal active surveillance cultures from the axilla, wounds, sputum, and endotracheal tube aspiration were performed on admission and weekly among a cohort of 1111 adult patients admitted to medical intensive and intermediate care units of the Johns Hopkins Hospital between March and June in 2006. Isolation precautions were implemented for patients with MDR Acinetobacter isolates susceptible to no more than 1 class of antimicrobial agents, excluding colistin. Patients previously known to have the organism were flagged in an administrative database for identification and isolation on readmission. Susceptibility testing was by the Phoenix 100 Automated Microbiology System (Becton-Dickinson, Sparks, Maryland) and agar dilution methods. Patients with missing data (12.5% for absent admission surveillance cultures and 4.8% for location prior to admission) were included in the analysis. Fisher exact test was used to compare categorical variables. All tests were 2-sided and \( P<.05 \) was considered statistically significant. Analyses were performed with Stata version 8.2 (Stata Corp, College Station, Texas). Our institutional review board approved the protocol and granted a waiver of informed consent.

Results. Five patients were previously known to be colonized with MDR Acinetobacter, 5 grew the organism within 48 hours of admission, and 3 grew the organism more than 48 hours after admission (none of whom had admission surveillance cultures obtained) (Table 1). Prevalence on admission was 10 of 1223 patients (0.82%; 95% confidence interval [CI], 0.39%-1.50%). Incidence of possible MDR Acinetobacter transmission (growth more than 48 hours after admission and absent surveillance cultures) was 0.43 (95% CI, 0.09-1.3) per 1000 patient days. Colonization pressure (MDR Acinetobacter patient-days divided by total patient-days) was 1.6% (108 of 6934 patient-days). Of 8 newly identified patients with MDR Acinetobacter, 4 did not grow the organism in clinical cultures but were identified by surveillance cultures alone.

A significantly higher proportion of patients with MDR Acinetobacter were admitted from a long-term care facility than patients without MDR Acinetobacter (46.2% vs 3.9%; risk ratio, 18.9; 95% CI, 6.6-54) (Table 2). Patients with MDR Acinetobacter were more likely to have paraplegia than were patients without MDR Acinetobacter (23.1% vs 1.1%; risk ratio, 22; 95% CI, 6.7-72). The majority of patients with MDR Acinetobacter were co-colonized with at least 1 other MDR pathogen: methicillin-resistant Staphylococcus aureus (n=8, 62%), vancomycin-resistant Enterococcus (n=10, 77%), and extended-spectrum \( \beta \)-lactamase gram-negative bacilli (n=5, 38%).

Comment. The potential consequences of MDR Acinetobacter transmission and infection include a crude mortality of 28% to 58%, prolonged mechanical ventilation, and prolonged stays in the hospital and intensive care unit. In this cohort, most MDR Acinetobacter was present on hospital admission and the undetected fraction of MDR Acinetobacter was 50%. Limitations include low sensitivity of MDR Acinetobacter surveillance cultures, small sample size of patients with MDR Acinetobacter, absent admission surveillance cultures, few wound and endotracheal cultures, and generalizability to other health care settings.

Although active surveillance cultures may be indicated during an outbreak, in general a population at risk should be defined before beginning an active surveillance program to detect MDR organisms. Although universal active surveillance cultures identified otherwise undetected patients with MDR Acinetobacter, screening all admissions required

Table 1. Comparison of 3 Surveillance Strategies to Detect Multidrug-Resistant Acinetobacter Among 1111 Patients Admitted to Selected Medicine Units in the Johns Hopkins Hospital, March Through June 2006

<table>
<thead>
<tr>
<th>Surveillance Strategy</th>
<th>Clinical Surveillance</th>
<th>Clinical and Universal Active Surveillance</th>
<th>Clinical and Targeted Active Surveillance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients previously known to have MDR Acinetobacter, No.</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Patients with MDR Acinetobacter detected within 48 h of admission, No.</td>
<td>2</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Patients with MDR Acinetobacter detected more than 48 h after admission, No.</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Admissions screened, No.</td>
<td>0</td>
<td>1223</td>
<td>52</td>
</tr>
<tr>
<td>Surveillance cultures performed, No.</td>
<td>0</td>
<td>1688</td>
<td>99</td>
</tr>
</tbody>
</table>

Abbreviation: MDR, multidrug-resistant.

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processing a large number of cultures. Targeting active surveillance cultures and isolation precautions to patients with recent exposure to a long-term care facility would have detected most newly identified patients by screening 52 admissions rather than more than 1200. Research is needed to analyze the efficacy and cost-effectiveness of this and other infection control strategies.

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Study concept and design: Maragakis, Miller, Carroll, Perl.

Acquisition of data: Maragakis, Tucker.

Analysis and interpretation of data: Maragakis.

Drafting of the manuscript: Maragakis.

Critical revision of the manuscript for important intellectual content: Maragakis, Tucker, Miller, Carroll, Perl.

Statistical analysis: Maragakis.

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Study supervision: Maragakis, Perl.

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Table 2. Characteristics of the Multidrug-Resistant *Acinetobacter* Surveill...