Acknowledgments

Potential conflicts of interest. B.L.: no conflicts.

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Clinical Infectious Diseases 2007; 44:765–6

1058-4838/2007/4405-0030$15.00
DOI: 10.1086/511695

High Colonization Pressure Might Compromise the Efficiency of Routine Methicillin-Resistant *Staphylococcus aureus* Screening

To the Editor—Routine screening for methicillin-resistant *Staphylococcus aureus* (MRSA) in the intensive care unit is a widely recommended [1] and quite well-studied [2–4] intervention. Yet, the recent study by Huang et al. [5] finally imparts a clinical imperative (the reduction of bacteremias) to the old epidemiological rationale of MRSA transmission control.

The study's sequential design allows for the assessment of multiple interventions, and its unique and very astute monitoring of methicillin-susceptible *S. aureus* bacteremias as a control excludes the possibility of natural fluctuations or other confounding factors, which were not accounted for in previous studies [2–4].

Thus, it is all the more deplorable that Huang and colleagues did not provide an estimation of the MRSA colonization pressure during the study interval. Colonization pressure is an important risk factor for MRSA acquisition in the intensive care unit [6]. A study of vancomycin-resistant *Enterococcus* transmission [7] concludes that a high colonization pressure may supersede the effect of other transmission variables, including infection-control measures. It does not seem unreasonable to extrapolate this phenomenon to MRSA, especially in light of high rates of gut carriage of the organism in colonized patients [8].

The MRSA carriage prevalence and incidence reported in the article by Huang et al. [1] evoke low colonization pressure. Indeed, no successful control of the spread of MRSA has been achieved by screening strategies in an environment of high colonization pressure (i.e., >50%).

Future studies of MRSA control in the intensive care unit need to report the colonization pressure that is prevalent in the study population, because the findings reported might not be applicable to intensive care units with high colonization pressure. In these cases, other, more aggressive measures might be required [8].

Acknowledgments

Potential conflicts of interest. I.P.: no conflicts.

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Clinical Infectious Diseases 2007; 44:766

1058-4838/2007/4405-0031$15.00
DOI: 10.1086/511689

Reply to Pavlov

To the Editor—We appreciate the comments by Pavlov [1] regarding the importance of colonization pressure and its likely effect on the success of screening cultures in reducing the transmission of methicillin-resistant *Staphylococcus aureus* (MRSA) and subsequent infection. Generally, colonization pressure may be described as the contagious influence that existing MRSA carriers have on the generation of new MRSA carriers. As stated in the original article, the importation of MRSA into our intensive care units was quite high, with 1 in 8 admitted persons harboring the organism. This, combined with new cases, resulted in an average of 17% of patients our intensive care units who were known to be MRSA carriers. Although these levels represent relatively high endemic levels of MRSA, Pavlov correctly points out that the screening benefit observed under our hospital conditions may not be reproducible at different endemic rates of MRSA. It is not known what lower threshold of overall colonization pressure is needed for routine screening to have a substantial impact. Similarly, it is not known whether routine

screening alone would be sufficient to prevent transmission in the context of extremely high endemic rates of MRSA or prolonged outbreak conditions.

Nevertheless, although estimates of colonization pressure provide key contextual information about the interpretation of our results, we note that it would be erroneous to control for its presence in evaluating the impact of screening on MRSA bacteremia. Because screening prevents transmission through subsequent contact isolation, the reduction in the number of incident cases not only reduces subsequent bloodstream events but also reduces colonization pressure itself. The prevalence of MRSA at admission may also decline over time in response to screening if readmission rates are high enough. Because colonization pressure is on the causal pathway, controlling for it would reduce or eliminate the intervention effect that one ultimately would like to measure.

Acknowledgments

Potential conflicts of interest. S.S.H.: no conflicts.

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Clinical Infectious Diseases 2007; 44:766–7
 1058-4838/2007/4405-0032$15.00
DOI: 10.1086/511696