

Adherence to CLSI Recommendations for Testing of *Staphylococcus aureus* Isolates in Louisiana Hospitals: Report of a Clinical Failure and Results of a Questionnaire Study[∇]

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Received 8 May 2011/Returned for modification 19 May 2011/Accepted 21 May 2011

We report a case of failure of clindamycin therapy due to inducible clindamycin resistance. We surveyed and found that only 52% of reporting hospitals in the state of Louisiana were performing the D test for inducible clindamycin resistance according to guidelines recommended by the Clinical and Laboratory Standards Institute (formerly the National Committee for Clinical Laboratory Standards).

A 7-year-old girl presented to her primary care provider for exacerbation of her eczema complicated by secondary skin infection. A skin culture yielded methicillin-resistant *Staphylococcus aureus* (MRSA) that was susceptible to clindamycin, cotrimoxazole, and vancomycin but erythromycin resistant. She was treated with oral clindamycin for 7 days, and the skin lesions improved. Ten days later she developed severe purulent cellulitis at the same site. She was admitted to our hospital for failure of outpatient therapy and begun on intravenous vancomycin. Repeat cultures from the site grew MRSA with resistance to clindamycin. After 48 h of intravenous vancomycin, there was a dramatic resolution of the skin lesions, and she was switched to oral cotrimoxazole. The cellulitis resolved promptly, and there was no further recurrence. Testing of the previous MRSA isolate confirmed the presence of inducible clindamycin resistance.

We conducted a survey to evaluate the adherence to Clinical and Laboratory Standards Institute (CLSI; formerly NCCLS) guidelines for the testing of *S. aureus* isolates among clinical microbiology laboratories in Louisiana hospitals.

The survey was conducted during the period of February 2009 to October 2009. A structured questionnaire was sent to microbiology laboratories at all 67 hospitals in the state of Louisiana. The questionnaire explored the characteristics of the hospitals, their antibiograms, and the clinical laboratory protocols for characterization of *S. aureus* isolates. A follow-up phone call was made to nonresponsive laboratories 1 month after the initial request.

Twenty-five hospitals responded to the survey (response rate = 37%). The participating hospitals were located in different geographic locations throughout the state of Louisiana and included primary, secondary, and tertiary care centers. The double-disk diffusion test (D test) was performed on *S. aureus* isolates at 20 of the 25 (80%) hospitals. Of these 20

hospitals, 7 hospitals performed the D test only “on request,” while the remainder ($n = 13$) performed it on all *S. aureus* isolates. Therefore, only 13 hospitals of the 25 responding hospitals (52%) performed the D test according to NCCLS/CLSI guidelines.

Clindamycin is an attractive agent for empirical therapy for suspected *S. aureus* infections because of its excellent pharmacokinetic and pharmacodynamic properties (1). Clinical failures of clindamycin therapy for treatment of MRSA infections have been documented for strains that were clindamycin sensitive but erythromycin resistant. The failures were due to inducible resistance to clindamycin (5, 11, 12). In a study by Hersh et al., pediatricians reported skepticism regarding non-adherence of laboratories to CLSI guidelines as one of the reasons for not obtaining cultures from skin and soft tissue infections (6). This skepticism may lead to reluctance to prescribe clindamycin for patients who may otherwise benefit from its unique properties.

Clindamycin resistance may be constitutive or inducible. Bacterial strains with an inducible genotype have a high potential for spontaneous mutation to a constitutive genotype during the course of clindamycin therapy (3). Routine antibiotic susceptibility tests cannot identify these strains. The D test is employed to detect inducible clindamycin resistance (4). It is simple, reproducible, and economic; however its use is still not universal. Since 2004, CLSI has recommended that all laboratories report D test-positive *S. aureus* isolates as resistant to clindamycin (8).

Clindamycin resistance is common among *Staphylococcus aureus* isolates, and the rates of resistance vary by region. In 2008, the Louisiana State Antibiotic Sensitivity Surveillance System reported that 27% of MRSA isolates were resistant to clindamycin (7). The frequency of *S. aureus* isolates with inducible clindamycin resistance may vary by region, age group, time period, and methicillin susceptibility (2, 5, 8, 11). It ranges widely, from 8% of community associated-MRSA isolates in Houston to 94% of MRSA isolates in Chicago (5, 10). Concomitant comorbidity is highly predictive for a positive D test (9, 11). Periodic surveillance of the prevalence of inducible

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[∇] Published ahead of print on 1 June 2011.

resistance is imperative to guide appropriate antibiotic therapy.

Despite the CLSI guidelines for performing the D test on all *S. aureus* isolates, only 52% of reporting hospitals were performing the D test as recommended. The results of this survey reflect data from one state; however, this report aims to increase the awareness of practicing physicians on a community and national basis about the need for adherence to these guidelines in order to prevent avoidable failures of clindamycin therapy and alleviate concerns about prescribing this unique compound.

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