Methicillin-Resistant Staphylococcus aureus Susceptibility Testing with the Abbott MS-2 System

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The antimicrobial susceptibilities of 100 methicillin-resistant Staphylococcus aureus strains were concurrently determined by the Abbott MS-2 System and by the standard disk diffusion method. Agreement between the two methods was 94% or greater for all of the antibiotics tested except for methicillin and gentamicin. This study indicates that the Abbott MS-2 cannot be relied upon for detection of methicillin resistance in clinical S. aureus isolates.

The antibiotic susceptibility testing capacity of the Abbott MS-2 System (Abbott Laboratories, Irving, Tex.) has not been previously fully evaluated for methicillin-resistant Staphylococcus aureus strains (1, 5). This report compares the antibiotic susceptibilities of 100 clinical isolates of methicillin-resistant S. aureus measured concurrently with the MS-2 (1, 5) and the standard agar disk diffusion methods (3). Very major (susceptible by MS-2 and resistant by agar disk diffusion) and major (resistant by MS-2 and susceptible by agar disk diffusion) discrepancies were arbitrated by a broth microdilution method (4).

The methicillin-resistant S. aureus strains isolated at our institution exhibited a multidrug resistance pattern by agar disk diffusion testing for the drugs that were tested (Table 1). The majority of strains were susceptible only to chloramphenicol. Our isolates also displayed zones of inhibition that exceeded the susceptible breakpoint for cephalothin; however, these results were interpreted with appropriate caution (3).

| Drug       | No. resistant by agar disk diffusion | No. in full accord | No. of MS-2 discrepancies by category: | No. of broth dilution MICs supporting* |
|------------|------------------------------------|--------------------|---------------------------------------|----------------------------------------|
|            |                                    |                    | Very major | Major | Minor | MS-2 | Agar disk diffusion |
| Methicillin| 100                                 | 24                 | 65         | 0     | 11    | 0    | 65                  |
| Gentamicin | 85                                  | 68                 | 14         | 3     | 15    | 4    | 13                  |
| Cephalothin| 4                                   | 94                 | 5          | 1     | 0     | 5    | 1                   |
| Erythromycin| 100                               | 98                 | 2          | 0     | 0     | 0    | 2                   |
| Chloramphenicol| 3                               | 98                 | 2          | 0     | 0     | 1    | 1                   |
| Penicillin | 100                                 | 99                 | 1          | 0     | 0     | 0    | 1                   |
| Tetracycline| 99                                 | 99                 | 0          | 0     | 1     | 0    | 0                   |
| Kanamycin   | 100                                 | 99                 | 0          | 0     | 1     | 0    | 1                   |
| Clindamycin| 100                                 | 100                | 0          | 0     | 0     | 0    | 0                   |

* Combined very major and major discrepancies only. MICs, Minimal inhibitory concentrations.
A total of 94 very major and major discrepancies occurred among results obtained with the MS-2 procedure. Of these 94 discrepancies, 83 were supported by the results of broth dilution tests. All results for methicillin, erythromycin, penicillin, and tetracycline by broth dilution were in agreement with the original agar disk diffusion data. Certain MS-2 discrepancies for gentamicin (4/17), cephalothin (5/6), and chloramphenicol (1/2), however, were not supported by broth dilution tests. In other studies, perfect correlation has not been obtained between microdilution and agar disk diffusion results, particularly for methicillin (2). Our results may be due to strain differences; e.g., our endemic strains may have grown more readily in the broth employed for microdilution testing.

This study indicates that the Abbott MS-2 System does not reliably detect methicillin resistance in clinical isolates of *S. aureus*. In addition, the gentamicin susceptibility results as determined by the MS-2 may not be reliable when multidrug-resistant *S. aureus* isolates are tested. Laboratory personnel committed to the MS-2 should be cautioned with respect to using this instrument when testing *S. aureus* isolates from hospital environments where methicillin-resistant strains are prevalent.

We thank Joan Arenius and the staff of the Hermann Hospital Clinical Microbiology Laboratory for excellent technical assistance.

**LITERATURE CITED**

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