Rapid Identification of *Staphylococcus aureus* in Positive-Testing Blood Cultures by Slidex Staph Plus Agglutination Test[▽]

In two recent articles in the *Journal of Clinical Microbiology*, Qian et al. (4) and Lagace-Wiens et al. (2) describe a direct coagulase and a thermostable DNase test, respectively, for direct identification of *Staphylococcus aureus* from positive blood culture bottles.

In a prospective study from April 2003 until February 2004, we investigated the accuracy of the Slidex Staph Plus agglutination test (bioMérieux, Marcy-l'Étoile, France) on positive blood cultures containing gram-positive cocci in clusters resembling staphylococci. This agglutination test utilizes latex particles sensitized with human fibrinogen and *S. aureus*-specific monoclonal antibodies. These monoclonal antibodies detect protein A by the Fc fragment of immunoglobulin G as well as different polysaccharide antigens on the bacterial cell surface. Parallel to a routine subculture on blood agar plates (Columbia III blood agar base with 5% sheep red blood cells; Becton Dickinson), 6 ml from each positive Bactec (Becton Dickinson, Sparks, MD) bottle was injected in a serum separator tube (Becton Dickinson). This tube was centrifuged at $2,000 \times g$ for 10 min. Subsequently, the supernatant was removed and a sample from the top of the separator layer containing the bacteria was taken with a sterile swab and subcultured on a blood agar plate. After incubation for a minimum of 4 h and a maximum of 6 h at 35°C with 5% CO₂, growth from this blood agar plate was tested with the Slidex Staph Plus test. The following day, the same agglutination test was performed on colonies from blood agar plates routinely subcultured and incubated overnight. All agglutination-positive isolates were confirmed to be *S. aureus* with a probe hybridization assay (AccuProbe; Gen-Probe, San Diego, CA).

A total of 249 positive blood cultures containing staphylococci were evaluated. Growth from a 4- to 6-h subculture on blood agar was compared with growth from an overnight subculture. Four blood cultures yielding coagulase-negative staphylococci were excluded from the analysis due to insufficient growth in the direct assay. There were 56 agglutination-test-positive overnight cultures, of which one was negative by the probe hybridization assay. Two of these agglutination-test-positive overnight cultures were negative by the 4- to 6-h test. There were 189 overnight cultures negative by the agglutination test. One blood culture was Slidex positive by the 4- to 6-h test, but after overnight culture, it showed autoagglutination. The culture was, erroneously, not tested for autoagglutination, and the isolate was probe hybridization negative. The sensitivity, specificity, and positive and negative predictive values for the agglutination test culture with a short incubation period (4 to 6 h) compared with the test agglutination test with overnight culture as the reference method were 96% (95% confidence interval [CI], 87 to 99%), 99% (95% CI, 97 to 99.9%), 98% (95% CI, 89 to 99.9%), and 99% (95% CI, 96 to 99.8%), respectively.

The direct Slidex Staph Plus test method is easy to perform and provides reliable same-day identification results in comparison with the reference method. The sensitivity of this agglutination method after a short period of subculture incubation is higher than that reported for direct testing by Staphaurex Plus on the bacterial pellet (23%) (5) and is also higher than that reported for the tube coagulase test (65 to 85%) (1, 4) and comparable to the sensitivities of fluorescent in situ hybridization (98%) (1, 3) and the thermostable DNase test (100%) (2). Although this technique utilized the Slidex Staph Plus test, which is considered a reliable agglutination test (6), other agglutination tests will probably have comparable results. However, differences in sensitivity and specificity can occur. These possibilities should be evaluated. The additional costs of this test are low. No specific equipment is needed except for a serum separator tube, and the procedure requires limited hands-on time. Therefore, we recommend our method for direct testing of Bactec blood culture bottles growing staphylococci.

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[▽] Published ahead of print on 21 November 2007.