Supplemental Material

Comparison of culture-based methods to identify colonization with methicillin-resistant and methicillin-susceptible *Staphylococcus aureus* in the context of co-colonization

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Supplemental methods

This method comparison was performed in the context of a randomized controlled trial investigating a one-week household-wide decolonization protocol using twice-daily nasal mupirocin and two chlorhexidine body wash events compared to an education control group. There were two decolonization groups, using an identical medication protocol, that differed in terms of the degree of participant contact to reinforce medication adherence. One of the medication groups received daily contact during the one-week period and the other medication group did not receive this contact. *A priori*, randomization to a decolonization arm was expected to impact both index participant and household member MRSA and MSSA prevalence. Hence, results from the enrollment home visit, prior to randomization, and from the three-month home visit, following treatment, were analyzed separately. Test sensitivity for the CHROMagar and broth-enrichment methods was calculated by dividing the number positive for the individual tests by the number positive if either test was positive (1), similar to work we previously have performed (2).

For the broth-enrichment method, multiple colonies were selected on the basis of

morphology on Columbia CNA blood agar and were subcultivated as needed, then transferred to Baird-Parker agar. Baird-Parker agar permits the growth of both coagulase-positive and coagulase-negative *Staphylococcus*; these groups are differentiated on the basis of lecithinase activity. All isolates demonstrating tellurite reduction and lecithinase activity were designated presumptive coagulase-positive staphylococci (CPS). All lecithinase-negative isolates were additionally tube-coagulase tested and any of these that were tube coagulase-positive isolates additionally were designated presumptive CPS. All presumptive CPS were identified to the species level.

Supplemental discussion

Copan E-swabs previously have demonstrated excellent sensitivity and utility for sample collection (3, 4). Similarly, CHROMagar staph aureus and CHROMagar MRSA have been favorably compared to a gold standard of identified blood agar isolates confirmed with Gram stain, catalase test, and latex agglutination for slide coagulase (5). Baird-Parker agar, enriched with ciprofloxacin, previously has been evaluated and determined to have excellent sensitivity as a screening medium for MRSA (6). However, use of Baird-Parker agar to detect *S. aureus* and other CPS from clinical specimens is not common.

The finding of coagulase-negative *Staphylococcus* (CNS) isolates, including *S. epidermidis*, that demonstrated lecithinase activity on Baird-Parker and hence were designated presumptive CPS by the broth-enrichment protocol was unexpected. In a prior study, lecithinase activity was identified using Baird-Parker agar in three (3.4%) of 117 CNS isolated from newborns: two *S. epidermidis* and one *S. haemolyticus* (7). Interestingly, our laboratory previously identified false positives on CHROMagar MRSA associated with presence of CNS species, specifically *S. epidermidis* and *S. warneri* (8).

Supplemental references

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