Evaluation of Chromogenic Agar for Screening Vancomycin-resistant Enterococcus (VRE)

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BACKGROUND

Currently, our institution uses an in-house mEnterococcus agar to differentiate between Enterococcus faecalis and Enterococcus faecium, but it has a long incubation time of 72 hours. New chromogenic agars, such as Colorex™ VRE media from PML Microbiologica and chromID™ VRE media from bioMérieux, have recently become commercially available, and have been shown to be superior for VRE identification.

OBJECTIVES

- To verify and validate the role of these agars in screening for VRE in an acute-care pediatric hospital setting

- To evaluate the effectiveness of the commercial chromogenic agars when compared with the in-house mEnterococcus agar

METHODS

The lower limit of detection was calculated by spiking a known quantity (CFU/mL) of VRE into normal stool specimens.

To quantify analytical sensitivity and specificity, a panel of 32 well-defined strains, including E. faecium, E. faecalis, Leuconostoc spp., Pedococcus spp., Candida spp., and Enterobacteriaceae, was used.

Inter-observer variability was evaluated by asking 4 experienced medical lab technologists to independently read each plate and document their findings, generating a Kappa (K) score to measure consistency.

Clinical specimens (n = 127) were plated onto the chromogenic agars to assess their clinical sensitivity and specificity.

Confirmation of VRE was done through the Roche LightCycler VRE Detection Kit, which detects the vanA and vanB vancomycin resistance genes.

RESULTS

The detection limit for the 3 plates in this study was 10^-4 CFU/mL. Visual discrimination of VRE colonies was easiest on the ColorexTM plate.

Inter-observer variability was noted for 2 of 32 specimens for the Colorex™ and chromID™ VRE agar (K = 0.875).

mEnterococcus agar had variability for 3 of 32 specimens (K = 0.811). Eight of 32 isolates on mEnterococcus agar were too small to identify and were noted to be "pinpoint" after 72 hours of growth; these were found to not be Enterococcus.

Table 1: Analytical sensitivity and specificity using n = 32 well-defined strains

<table>
<thead>
<tr>
<th>Medium</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorex™</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>chromID™</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>mEnterococcus</td>
<td>100</td>
<td>79</td>
</tr>
</tbody>
</table>

CONCLUSIONS

- The Colorex™ agar was superior to both the chromID™ and in-house mEnterococcus agar

- The Colorex™ agar correctly identified the small colony variant VRE previously observed in Ontario, which was not found on either of the mEnterococcus or chromID™ agars

- The Colorex™ agar exhibited superior sensitivity when clinical specimens were evaluated

REFERENCES


