**CHROMAgar Acinetobacter media for detection of multidrug resistant (MDR) Acinetobacter in surveillance cultures**

K. Culbreath, M. Miller, K. Rodino, M. Jones P. Gilligan

Clinical Microbiology and Immunology Labs, Department of Pathology, University of North Carolina Chapel Hill

Chapel Hill North Carolina

**Abstract**

MDR-Acinetobacter baumannii (MDR-Acin) has emerged as an important nosocomial pathogen. Sensitive culture techniques are needed to identify patients colonized/infected with MDR-Acin so appropriate epidemiological precautions can be taken to prevent the spread of the organism to other patients. Currently there are no recommended media for the isolation of this organism from surveillance cultures. We investigated the utility of a newly developed MDR-Acin isolation media, CHROMAgar Acinetobacter (CA-Acin) (CHROMagar, Paris, FR) compared to BHI Broths with 16 μg/ml Imipenem to detect MDR-Acin. Surface swabs (n=258) and respiratory specimens (n=257) were obtained from hospital inpatients between July and November 2008 and inoculated into BHI-Imipenem or CA-Acin. BHI-Imipenem broth plates were incubated for 24 hours and evaluated for the presence of Acinetobacter. The CA-Acin plates were screened for Acinetobacter by evaluating the plates for teal colonies growing at 24 hours. The identity of teal colonies was determined using TSI slant and the Vitek2. Colonies identified as specific for the organisms. However, there is not currently effective media for screening cultures among hospital infection control practitioners. Nosocomial outbreaks caused by Multi-Drug Resistant Acinetobacter (MDR-Acin) are thought to be the main culprit in MDR-infections. Here, we analyze the ability of chromogenic media for the detection of Acinetobacter in screening cultures from ICU patients.

**Background**

BHI-Imipenem Broth vs. CHROMAgar Acinetobacter Media

Surface swabs and respiratory specimens were obtained from hospital inpatients between July and November 2008 and inoculated into BHI-Imipenem or CA-Acin. BHI-Imipenem broth plates were incubated for 24 hours and evaluated for the presence of Acinetobacter. The CA-Acin plates were screened for Acinetobacter by evaluating the plates for teal colonies growing at 24 hours.

CHROMAgar Acinetobacter vs. CHROMAgar Acinetobacter Red

Surface swabs and respiratory specimens were obtained from hospital inpatients between January and May 2009 and onto CA-Acin or CA-Acin Red. The CA-Acin plates were screened for Acinetobacter by evaluating the plates for teal or red colonies growing at 24 hours. Colorless colonies were incubated an additional 24 hours to evaluate chromogenic activity.

Acinetobacter was identified by VITEK II and antimicrobial susceptibility was determined by Kirby-Bauer Method. Isolates defined as MDR are intermediate or resistant to 4 or more of the following:

- a. Beta-lactams
- b. Aminoglycosides
- c. Quinolones
- d. Antimetabolites
- 1. Glycylines

To be considered resistant to a Class, the organism must be resistant to all members of the class tested.

**Results**

Table 1. Detection of MDR Acinetobacter using Imipenem-Broth and CHROMAgar Acinetobacter media. Cultures were considered positive at 24 hours (B) or demonstrated teal colonies (CHROMAgar Acinetobacter). Confirmatory tests were performed to identify the organisms grown in these cultures.

<table>
<thead>
<tr>
<th></th>
<th>Total Tests</th>
<th>Positive</th>
<th>All Acinetobacter</th>
<th>MDR Acinetobacter</th>
<th>Non-MDR Acinetobacter</th>
</tr>
</thead>
<tbody>
<tr>
<td>BHI-Imipenem</td>
<td>515</td>
<td>135</td>
<td>32</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td>CHROMAgar Acinetobacter</td>
<td>515</td>
<td>84</td>
<td>45</td>
<td>20</td>
<td>15</td>
</tr>
</tbody>
</table>

Table 2. Performance of CHROMAgar Acinetobacter media compared to Imipenem-Broth culture in detecting MDR Acinetobacter.

<table>
<thead>
<tr>
<th></th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHROMAgar</td>
<td>96.80%</td>
<td>88.90%</td>
<td>99.80%</td>
</tr>
</tbody>
</table>

**Summary and Conclusion**

Compared to Imipenem broth, CHROMAgar Acinetobacter media is effective in recovering MDR Acinetobacter in 24 hour cultures.

- Acinetobacter produces distinctive teal colonies on CHROMAgar Acinetobacter media. However Acinetobacter colonies resemble those produced by S. maltophilia and P. aeruginosa. These organisms must be differentiated to confirm the presence of MDR Acinetobacter.
- CHROMAgar Acinetobacter media is ineffective in recovering MDR Acinetobacter from screening cultures obtained from skin and respiratory sites. However, due to breakthrough of MMDR and non-MDR P. aeruginosa and S. maltophilia laboratories should perform additional testing to confirm the presence of MDR Acinetobacter

**References**


**Figure 1.** Organisms identified in (A) Positive Imipenem-Broth and (B) CHROMAgar Acinetobacter cultures.

**Figure 2.** Appearance of MDR Acinetobacter on CHROMAgar Acinetobacter and CHROMAgar Acinetobacter Red Media.

**Figure 3.** Identification of organisms recovered using CHROMAgar Acinetobacter and CHROMAgar Acinetobacter Red media.