Comparison of Commercially Available Methods (StrepB Carrot Broth™ and GBS Medium) for the Detection of Group B Streptococci

M. Sarina*, R. Middleton†, T. Zumwalt*, L. Medlock*, A. Y. Hsuing*, S. Strickler‡, J. Hardy‡

*Central Coast Pathology Consultants, San Luis Obispo, CA †Hardy Diagnostics, Santa Maria, CA

Abstract

Group B Streptococci (GBS) remains one of the leading causes of sepsis and meningitis in neonates despite recent advances in the prevention of neonatal group B streptococcal (GBS) disease. Although the current gold standard method is the LM broth method, as recommended by the Centers for Disease Control and Prevention (CDC) (1), several alternative methods have been developed with comparable sensitivity, specificity, and reduced turnaround time. The purpose of this study was to determine the accuracy of two recently launched products: StrepB Carrot Broth™ (Hardy Diagnostics, Santa Maria, CA) and GBS Medium (Northeast Laboratory Services, Winslow, ME).

Introduction

GBS is one of the most frequent causes of pelvic infection in neonates under seven days of age. Neonates can acquire GBS during birth from their mothers, who are colonized with GBS. Approximately 10% to 30% of pregnant women are colonized with GBS in the vaginal-rectal region. Early onset disease is defined as GBS infection during the first seven days of life and constitutes approximately 80% of GBS infections. GBS infections in neonates can result in sepsis, meningitis, pneumonia, and other serious conditions. Accurate detection of GBS in the vaginal-rectal region is vital to the prevention of neonatal GBS disease. Due to screening efforts and the use of intrapartum antibiotics it is estimated that 3,900 infections in neonates and 200 neonatal deaths were prevented (1,2).

To prevent neonatal infection the CDC recommends screening all pregnant woman for vaginal and rectal GBS between 35 and 38 weeks of gestation. The current gold standard method for GBS detection is incubation of specimen in LM broth followed by subculture onto a blood agar plate. However, detection of GBS has been developed with comparable or even superior sensitivity and selectivity. These alternatives have been developed to reduce turnaround time, cost, and personnel time.

StrepB Carrot Broth™ (Hardy Diagnostics, Santa Maria, CA) and GBS Medium (Northeast Laboratory Services, Winslow, ME) are selective and differential media which detect GBS within 6 to 24 hours. Both of the test methods are designed to give rapid results without relying on subculture from a selective enrichment broth. This decreases the time and expense required for test setup. Detection of GBS is based on the production of an orange pigment by GBS when grown on media containing starch, dextrose, and other pigment enhancing supplements. The production of this orange pigment is limited to human strains of beta-hemolytic GBS. GBS Medium detected 75% (25 specimens) of the 25%-25% of clinical specimens tested were positive for GBS. StrepB Carrot Broth™ successfully detected all hemolytic strains (n=23), with strong positive reactions. Neither StrepB Carrot Broth™ nor GBS Medium gave false positive results.

Discussion

The rate of detection of GBS in this study by StrepB Carrot Broth™ is in accordance with recent surveys and publications (1,4-10).

Materials and Methods

- GBS screening samples were collected at Central Coast Pathology Consultants, San Luis Obispo, CA between June 2005 and December 2006.
- Samples were collected using azole, thymol in sponges, and the suspension was inoculated into StrepB Carrot Broth™ and GBS Medium.
- Tests were set up, incubated, and read in accordance with manufacturer’s instructions.

Results

Table 1: Comparison of sensitivity between StrepB Carrot Broth™ and GBS Medium on clinical specimens tested.

<table>
<thead>
<tr>
<th>GBS Positive (n=25)</th>
<th>Total Positive Reactions</th>
<th>StrepB Carrot Broth™</th>
<th>GBS Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>GBs Positive (n=25)</td>
<td>23 (92%)</td>
<td>23 (92%)</td>
<td>23 (92%)</td>
</tr>
<tr>
<td>Strong Positive Reactions</td>
<td>23 (92%)</td>
<td>23 (92%)</td>
<td>23 (92%)</td>
</tr>
<tr>
<td>Weak Positive Reactions</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Negative Reactions</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>GBS Negative (n=75)</td>
<td>72 (96%)</td>
<td>72 (96%)</td>
<td>72 (96%)</td>
</tr>
<tr>
<td>Non-hemolytic strains</td>
<td>65 (87%)</td>
<td>65 (87%)</td>
<td>65 (87%)</td>
</tr>
<tr>
<td>Positive Reactions</td>
<td>72 (96%)</td>
<td>72 (96%)</td>
<td>72 (96%)</td>
</tr>
<tr>
<td>Negative Reactions</td>
<td>72 (96%)</td>
<td>72 (96%)</td>
<td>72 (96%)</td>
</tr>
</tbody>
</table>

StrepB Carrot Broth™ can be used as a reliable tool for detection of hemolytic GBS in neonatal screening.

References


- Central Coast Pathology Consultants, San Luis Obispo, CA
- Hardy Diagnostics, Santa Maria, CA
- Hardy Diagnostics, Santa Maria, CA