Implementation of the Great Basin Group B Streptococcus (GBS) Assay using Hardy Carrot Broth in a Community Hospital Laboratory

Elena Isley MT(ASCP), Sandra Elliott MLT(ASCP), Susan Webber MS, MT(ASCP), Laura J. Tafe MD
1. Alice Peck Day Memorial Hospital, Lebanon, NH, USA; 2. Dartmouth Hitchcock Medical Center, Lebanon, NH, USA

ABSTRACT

**Introduction**

Streptococcus agalactiae or Group B Streptococcus (GBS) is a Gram-positive bacterium that remains a leading cause of serious illness and death in newborn populations. Approximately 10–30% of all pregnant women are colonized with GBS in the genitourinary or gastrointestinal tract, and during labor or breast milk may infect the newborn. This happens most commonly when GBS ascends the vagina to contact amniotic fluid after membrane rupture, but may also occur through intact membranes by aspiration or by mucous membrane exposure during passage through the birth canal, leading to neonatal sepsis and meningitis.

Screening for GBS colonization in antepartum women between 35 and 37 weeks gestation, followed by intrapartum antibiotic treatment for women with positive colonization status has proven to be an effective mechanism for prevention of perinatal GBS disease. GBS colonization may be transient, intermittent or persistent throughout pregnancy. Screening is most effective when performed on specimens collected no more than 5 weeks prior to delivery—35-37 weeks gestation, and after enrofloxacin with selective broth medium.

The 2010 CDC GBS Prevention Guidelines (Figure 1) recommend a vaginal-rectal swab incubated 18-24 hours in pigmented or non-pigmented enrichment broth. For pigmented broth a positive color indicates or is reported as GBS positive. Because the pigmented broth will not detect non-hemolytic strains of GBS, negative pigmented broth specimens are further tested using culture methods, latex agglutination, DNA probe or nucleic acid amplification test (NATT). Hardy Diagnostics’ Strept B Carrot Broth was already in use in our laboratory first in a culture only test, and more recently in combination with the Meridian Illumigene Group B strep assay. In an effort to streamline the process and control costs we wanted to continue using the initial pigmented enrichment broth to screen out the first round of positive specimens, which would not require further testing.

**METHODS**

All samples were incubated for 18-24 hours in Hardy diagnostics Strept B Carrot broth as the enrichment broth as opposed to Great Basin Enriched LMM broth. The broth specimens were s/pH and used for testing on both the Great Basin and Illumigene platforms.

Samples included 20 known GBS and 20 known E. faecalis QC organisms incubated in Strept B Carrot broth, tested over 20 separate days by multiple technologists, and 26 patient specimens run concurrently with the Illumigene Pro GBS Assay (Meridian Bioscence) which was the procedure in place. Following incubation in broth for 18-24 hours, samples underwent automated sample preparation and PCR on the PA500 Portrait Analyzer System to amplify a cfb gene sequence specific to the GBS genome. The Portrait GBS assay is fully automated from sample to result, and uses hot-start PCR for gene amplification in a completely closed system, single use cassette.

**RESULTS**

Of the 20 known positive and 20 negative control specimens tested, all yielded the expected result. Of the 26 patient specimens, 19 were negative by broth, Illumigene and Great Basin GBS. Of the 7 positive specimens, 3 were also positive by pigment change in Carrot broth, 2 were positive by culture, CAMP and or Vitek GP ID, and 2 were positive by Illumigene.

**CONCLUSIONS**

The Great Basin GBS assay demonstrated 100% concordance with expected results over 66 specimens and three methodologies. The Hardy Diagnostics Strept B Carrot broth has proven an effective enrichment media for the Great Basin GBS assay and is compatible with the test cartridge and components.

In our current workflow, negative Strept B Carrot broth specimens are further tested using the Great Basin GBS Assay to detect non-hemolytic strains of GBS. Strept B Carrot broth positive specimens are reported as Positive for Group B Streptococcus. Positive broth specimens in patients who are allergic to Penicillin are subcultured for susceptibility testing.

**REFERENCES**

2. Photo: https://catalyg.hardydiagnostics.com/cbmp/end/Content/Img/Strp/Broth/Illumigene.png?c=120