

# Comparison of the Rate of Recovery of Group B Streptococci from Genital Specimens Inoculated into Group B Selective Broth and Sub-cultured to Neomycin Nalidixic Acid Plates and Three Different Chromogenic Media.

N.S. Smith, S. Henwick, D. Chow, M. Walz, K. Upshon

Department of Microbiology BC Biomedical Laboratories Ltd, Surrey B.C.

## Revised Abstract

**Background:** Group B Streptococci can cause devastating neonatal infections including septicaemia and pneumonia within the first 7 days of life. A risk factor for developing invasive neonatal infection is the colonization of the mother's urogenital or gastrointestinal tract with Group B Streptococci. Collection of a single-combined vagino-rectal swab is recommended for maternal screening for Group B Strep. Large amounts of normal flora are present in these specimen types. The use of selective broths and plates help to reduce this normal flora and allow for the visualization of small amounts of organism. The purpose of this study was to compare the results when a Group B Selective broth is sub-cultured to a neomycin nalidixic acid (NNA) plate as well as to three different chromogenic media (made by CHROMagar, Bio-Rad, and Biomerieux).

**Method:** Prenatal vagino-anorectal and vaginal specimens were inoculated into a Group B Selective broth and incubated overnight at 35°C. An aliquot was then inoculated onto a NNA plate as well as one of each of the three chromogenic plates being tested.

**Results:** A total of 213 patient samples were tested and 69 (32.4%) specimens showed a positive result on at least one of plates.

**Conclusion:** The sensitivity of the CHROMagar and Bio-Rad plates were comparable to the NNA while the Biomerieux plates showed significantly reduced sensitivity. All three chromogenic plates allow for easier visualization of the pathogen than does the NNA, especially from very mixed cultures. The ability to detect a non-haemolytic strain of Group B Streptococci from a mixed culture is greatly enhanced when using a chromogenic plate.

## Background

Group B Streptococci can cause devastating neonatal infections including septicaemia and pneumonia and intrapartum antibiotics have been shown to decrease the risk of developing these complications. A risk factor for developing invasive neonatal infection is the colonization of the mother's urogenital or gastrointestinal tract with Group B Streptococci. Pregnant women who are known to be colonized with Group B Streptococci are then offered intrapartum antibiotic prophylaxis.

Collection of a single-combined vagino-anorectal swab is recommended for maternal screening for Group B Streptococci. Large amounts of normal flora are present in these specimen types and this normal flora may obscure the presence of Group B Streptococci. The use of selective broths and plates help to reduce this normal flora and allow for the visualization of small amounts of the target organism.

The purpose of this study was to compare sensitivities when a Group B Selective broth is sub-cultured to a neomycin nalidixic acid (NNA) plate as well as to three different chromogenic media.

## Method

Prenatal vagino-anorectal and vaginal specimens were inoculated directly onto a colistin nalidixic acid plate (CNA) followed by inoculation into a Group B Selective Broth (GBB). After overnight incubation, a loop full of broth was inoculated onto each of the following plates: a neomycin nalidixic acid plate (NNA), CHROMagar Colorex™ Strep B, Bio-Rad StrepBSelect plate™, and the BiorMerieux chromID™ Strepto B. The NNA plates were incubated overnight at 35°C in CO<sub>2</sub> and the chromogenic plates were incubated overnight at 35°C in ambient air. The plates were examined by a microbiology technologist [NSS] for suspect colonies with the identification of suspect Group B Streptococcus colonies confirmed using the PathoDx latex grouping kit tested directly off each of the plates.

The sensitivity of each chromogenic agar was compared to the NNA plate using the Chi-Square test with the level of significance,  $p < 0.05$ . Similarly, the four post-broth agars were compared to the sensitivity of the CNA plate inoculated directly from the specimen.

Experienced microbiology technologists were informally asked their opinions regarding which of the chromogenic media they preferred.

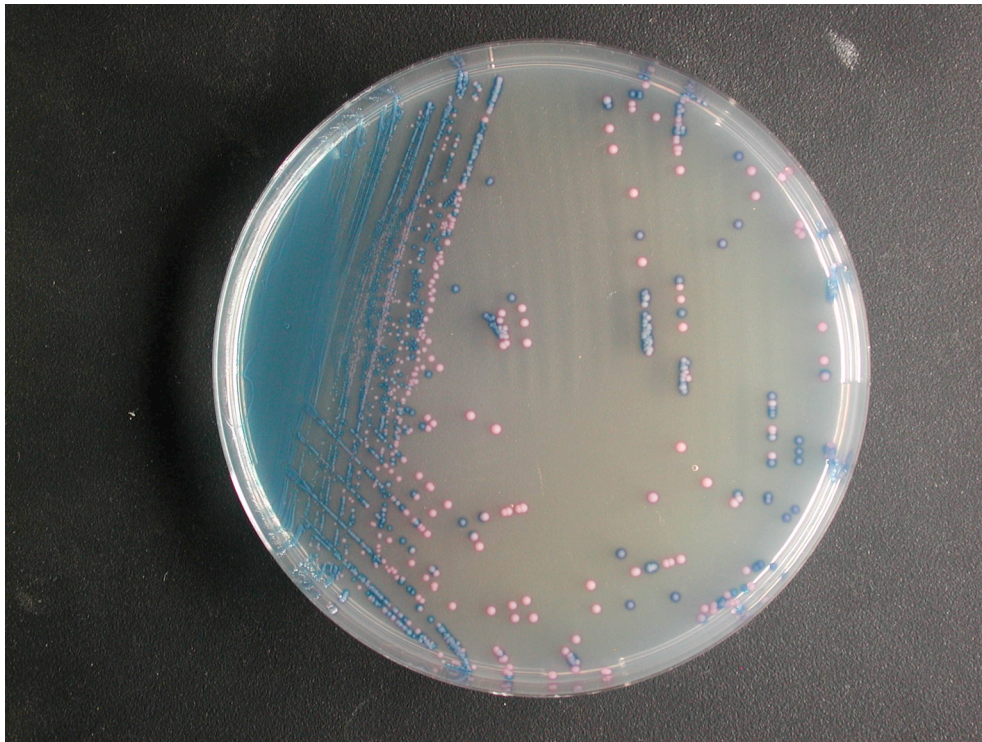
## Results

A total of 213 patient samples were tested. A total of 69(32.9%) specimens showed a positive result on at least one the plates sub-cultured from the broth.

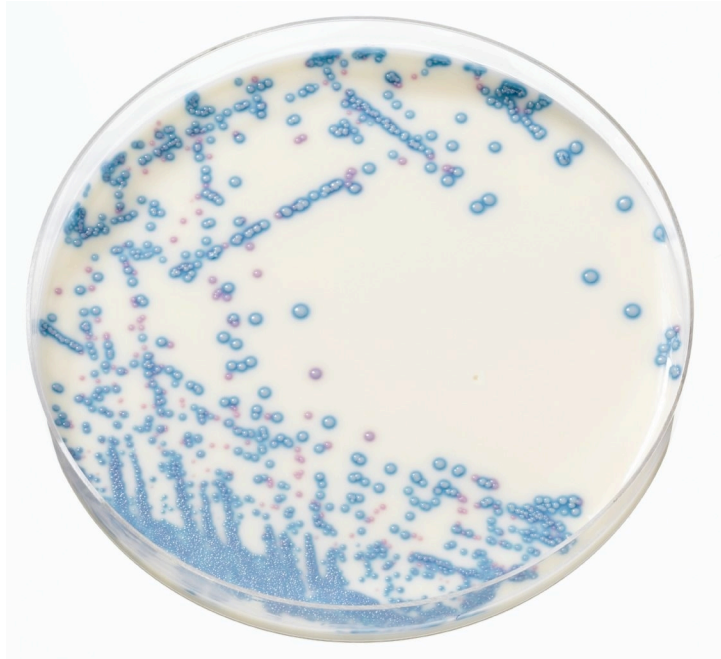
Plate	Number of positives (n=69 positives total)
Pre-Broth CNA	50 (72.5%)
NNA	67 (97.1%)
CHROMagar Colorex™ StrepB	68 (98.6%)
Bio-Rad StrepB Select™	68 (98.6%)
BiorMerieux chromID™ Strepto B	60 (87%)

One Group B Streptococcus isolate was detected on the NNA plate only; whereas two isolates were not detected on the NNA plate despite being detected on all other plates (including the primary CNA plate). One non-haemolytic isolate was isolated during the study and was detected on all four post-broth plates.

The Biomerieux chromID™ Strepto B plate detected significantly fewer patients with Group B Streptococcus than the NNA and the other two chromogenic media; approximately 10% fewer positive patients were detected. Each of the four post-broth plates detected significantly more positive patients than did the directly plated CNA method.



*CHROMagar Colorex™ Strep B plate-Group B Streptococci is the mauve coloured isolate*



*Bio-Rad StrepBSelect-Group B Streptococci is the blue coloured isolate*

## Conclusions

1. In this study, sensitivity of the CHROMagar and Bio-Rad plates were similar to the NNA plate, while the Biomerieux plate showed significantly reduced sensitivity. The detection of about 10% fewer positive patients may also be considered to be clinically significant.
2. Each of the four media inoculated from the incubated Group B Selective Broth detected significantly more positive patients than the CNA plated directly from the specimen.
3. All three chromogenic plates allow for easier visualization of the pathogen, especially from very mixed cultures. The ability to detect non-haemolytic strains of Group B Streptococci from a mixed culture is greatly enhanced when using a chromogenic plate. In the clinical laboratory setting, the NNA plate may result in the work-up of more organisms in an effort to rule out Group B Streptococci. Also, in the hands of less-experienced microbiology technologists, there is a possibility that some Group B Streptococcus colonies may be missed.
4. Preference amongst the microbiology technologists was not uniform. Some technologists preferred the translucent agar, while others preferred the opaque agar.