C139

Evaluation of Two Chromogenic Media for the Isolation of VRE (Vancomycin Resistant Enterococci)

C.C. Rutherford[1, 2], L.H. Wilcox[1, 2], S.E. Dale[1, 2, 3, 4]

The Hamilton Regional Laboratory Medicine Program (HRLMP)[1], Hamilton Health Sciences[2], St. Joseph's Healthcare[3] and the Department of Pathology and Molecular Medicine, McMaster University[4], Hamilton, Ontario Canada

Contact: rutherf@hhsc.ca

Modified Abstract

Background: Efforts to control the spread of VRE place a burden on Microbiology Laboratories. Recently chromogenic agars with vancomycin have become available that may facilitate the rapid identification of VRE. We compared bioMérieux chromID™ VRE (BMX) and PML Microbiologicals COLOREX™ VRE (PML) with the medium used in our laboratory, bile aesculin azide agar with 6mg/L vancomycin (BEAA-V6). Methods: Rectal swabs for VRE surveillance (n=605) were selected after inoculation to BEAA-V6 in the clinical laboratory. The chromogenic media were randomly inoculated and streaked by hand or using an Isoplater. Chromogenic plates were examined after 24 and 48 hours incubation (±0.5 hrs). BEAA-V6 plates were examined only after 48 hours incubation. The presence and amount of target (appropriately coloured) and non-target colonies was recorded. Target colonies on PML were magenta-red/blue and on BMX were magenta/red-purple (*E. faecium*) or blue-green (*E. faecalis*). Target colonies were identified and speciated both phenotypically and by PCR for *van*A, *van*B and ddl genes. Results: VRE (n=32) were detected by one or more of the media. After 24 hours incubation, 31/32 and 25/26 VRE were recovered on the PML and BMX media, respectively. Extending the incubation to 48 hours recovered 1 additional VRE isolate on each chromogenic medium. The majority of isolates (31) were VanA *E. faecium* and 1 was VanB *E. faecium*. The sensitivities of VRE recovery were 100% (32/32) for PML, 81.3% (26/32) for BMX and 75% (24/32) for BEAA-V6. Increasing the incubation time to 48 hours reduced the specificity of each medium for VRE. Compared to 24 hours, where 4 non-VRE target colonies grew on both the PML and BMX media, at 48 hours 51 (PML), 19 (BMX) and 111 (BEAA-V6) non-VRE colonies required investigation. Conclusions: PML and BMX chromogenic VRE media are more sensitive and specific than BEAA-V6 for the isolation of VRE. Both media reduce the workload associated with nosocomial surveillance. The BMX medium can differentiate *E. faecalis* from *E. faecium* based on colour, however the PML medium detected more VRE than the BMX medium after 24 hours incubation with less overgrowth on non-VRE rectal flora.

Background

The Microbiology Laboratory of HRLMP screens ~1200 specimens weekly for VRE using bile aesculin azide agar with 6 mg/L vancomycin (BEAA-V6). Black colonies are screened by gram stain and catalase and investigated for *van*A and *van*B genes by PCR. Approximately 250 PCR reactions are performed per week, substantially more during outbreaks, due to the lack of specificity of BEAA-V6.

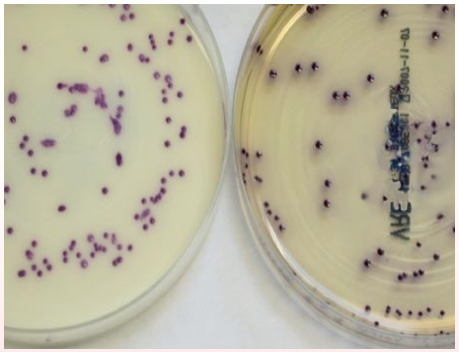
Objectives

- To compare the sensitivity and specificity of the chromogenic VRE media ChromID™ VRE (bioMerieux) and COLOREX™ VRE (PML Microbiologicals) with BEAAV6 for the isolation of VRE from rectal screening specimens.
- To evaluate the media for their effect on workload.

Methods

- Swabs (n=605) inoculated to chromogenic media after processing to BEAA-V6
- Plates inoculated randomly. Incubated in air at 35ºC.
- Chromogenic plates examined at 24 and 48 hrs +/- 15 minutes. BEAA-V6 only read after 48 hours incubation.
- Phenotypic identification: catalase, gram stain, Brain Heart Infusion agar with 6 mg/L vancomycin (BHIV6)
- Genotypic identification: Multiplex PCR for *van*A/*van*B
- Expanded gold standard (VRE isolated from any medium) used to calculate sensitivity, specificity, PPV, NPV

Target colonies of *E. faecium* VRE on Chromogenic Media After 24 hours Incubation



PML Microbiologicals COLOREX™ VRE Medium

bioMérieux ChromId™ VRE Medium

Results

Number of VRE Isolated from each Medium

Medium	24 hrs	48 hrs	Overall
PML	31	32	32/32
BMX	24	26	26/32
BEAA-V6	NA	24	24/32

Media Performance for Each Incubation Period

24 Hours

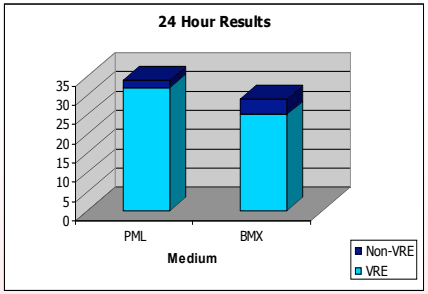
	SENS	SPEC	PPV	NPV
PML	100%	99.3%	88.6%	100%
BMX	77.4%	99.3%	85.7%	98.8%
BEAA-V6	NA[a]	NA	NA	NA

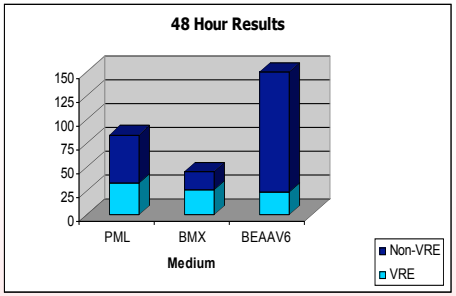
[a] Not applicable

48 Hours

	SENS	SPEC	PPV	NPV
PML	100 %	91.9 %	38.6 %	100%
BMX	81.3 %	97.4 %	63.4 %	98.9 %
BEAA-V6	75%	80.6 %	17.8 %	98.1 %

Work Up vs. Yield of VRE





Conclusions

- Each chromogenic medium is more sensitive and specific than BEAA-V6 for the isolation of VRE.
- Each chromogenic medium read at 24 hrs reduced workload compared to BEAAV6 (PML (77% less work), BMX (84% less work)).
- TAT is reduced if chromogenic plates are examined after 24 hrs incubation only; however some VRE may be missed.
- The BMX medium can differentiate between *E. faecalis* and *E. faecium* based on colour.
- The PML medium detected more VRE than the BMX medium after 24 hours incubation with less overgrowth of non-VRE rectal flora.

Financial support was provided by PML Microbiologicals for the presenting author to attend ASM 2008.