Region Hovedstaden
Det nye Rigshospital

Prevalence and identification of VRE - carrying the *vanB* gene.

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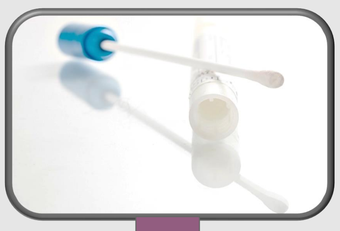
INTRODUCTION

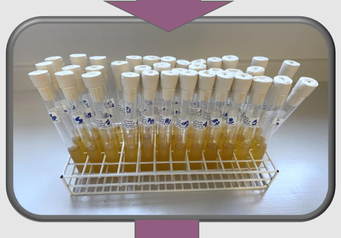
Increasing prevalence of *vanB* positive *Enterococcus spp*. in blood infections makes identification of these in screening samples important.
The rectal swabs, which are used for screening, contain other species with *vanB* than *Enterococcus spp.*, leading to false positive PCR results. Trying to identify *vanB*-carrying enterococci on selective agar afterwards has proven to be difficult.
It is often discussed whether screening upon admission can lower the risk of Vancomycin-Resistant Enterococci(VRE) outbreaks.[1]

AIM

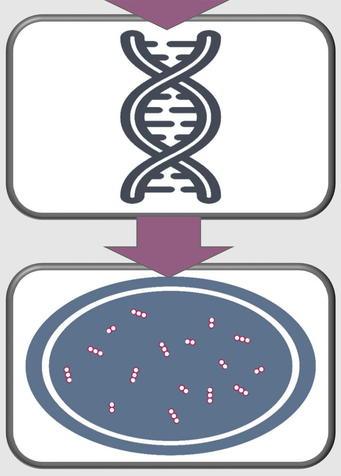
The purpose of this study was to compare the conventional method used in the laboratory to routinely identify *vanB* positive enterococci with a selective broth increasing the growth of *Enterococcus spp.*
Additionally, patients admitted to the neuro intensive care unit (ICU), were screened at admission to identify the VRE prevalence in rectal swabs from this group of patients.



400µl liquid from rectal swab



Incubation in BHI broth containing:
Amoxicillin
Amphotericin B
Aztreonam
Colistin



PCR on the BDMax™ system

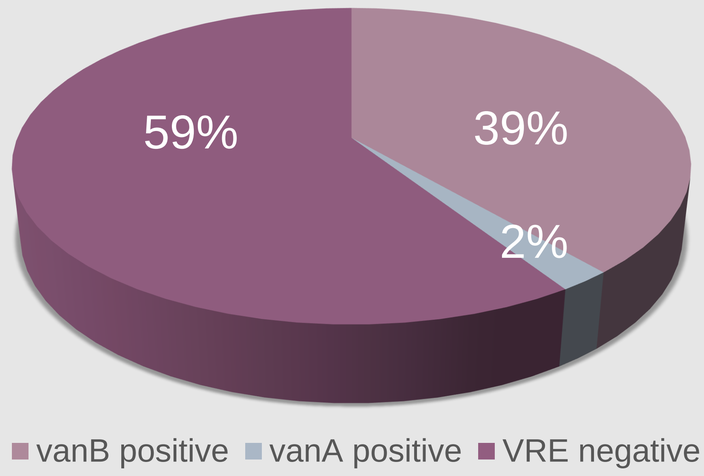
Culturing VRE on selective agar

METHOD

93 rectal swabs collected from patients at admission to Neuro ICU were screened for *vanA/vanB/vanC* using the BDmax™ system and BioGX reagents. V*an*-positive samples were cultured on a selective VRE agar, grown in a selective broth and cultured on BD selective CHROMagar afterwards

RESULTS

We investigated 93 rectal swabs from patients arriving at neuro ICU sampled in the period from April 2018 to January 2019. Of these, 2 (2/93, 2%) were positive for *vanA* and 36 were positive for *vanB* (36/93, 39%). Of the 36 *van*B positive isolates 7 were able to grow on selective agar with vancomycin (1 *E*. *gallinarum*, 1 *E. faecium* and 5 *E. faecalis*). Confirmatory PCR on these isolates showed one *van*C *E. gallinarum* and negative results for the remaining isolates, yielding an overall VRE prevalence of 3/93, 3%.
PCR on the selective broth from the 36 *van*B positive samples reduced the amount to 29 *van*B positives. A decrease of 19.4%.



CONCLUSION

These results illustrate that a large part of the screened samples is PCR-positive for *vanB* without being localized in an *Enterococcus spp..*This makes screening for carriage during outbreaks more difficult and laborious with many false-positive samples. Our testing of the selective broth revealed a decrease in the amount of *van*B positive screening samples. Using the broth as a pre-PCR step to eliminate the majority of other species from the swab could be a solution for the future VRE diagnostics.
The low prevalence at admission indicates that screening of previously non-hospitalized patients is not likely to diminish outbreaks.

1) Hammerum, A. M., Justesen, U. S., Pinholt, M., Roer, L., Kaya, H., Worning, P., ... & Holzknecht, B. J. (2019). Surveillance of vancomycin-resistant enterococci reveals shift in dominating clones and national spread of a vancomycin-variable vanA Enterococcus faecium ST1421-CT1134 clone, Denmark, 2015 to March 2019. Eurosurveillance, 24(34).

Photos from www.colourbox.dk and Christina Nielsen.