Rapid detection of vancomycin-resistant enterococci (VRE) carriers in a tertiary Greek hospital

Sarrou Styliani[1,2], Florou Zoi[2] , Malli Ergina[1], Petinaki Efthymia[1,2]

[1] Microbiology Laboratory, University Hospital of Larissa, Larissa, Greece

[2] Department of Microbiology, Faculty of Medicine, University of Thessaly, Larissa, Greece

Background

Vancomycin-resistant enterococci (VRE) are important causes of healthcare-associated infections. In Greece the percentage of VRE, ranges between 17% and 26%, while higher rates are observed in Long Term Healthcare Units (LTHUs). University Hospital of Larissa (UHL) is a tertiary hospital in central Greece that serves and accepts patients from local healthcare units. Aim of the present study was to evaluate a rapid molecular method compared to the conventional culture method for the detection of VRE colonized patients upon their admission to our hospital

Material/methods

Following the protocol of UHL every patient upon his admission is checked for colonization by multidrug-resistant bacteria (VRE, MRSA, carbapenem resistant gram negative). Between September and November 2015, 200 patients admitted to UHL from other hospitals and LTHUs, were screened for VRE colonization. Rectal swabs were collected and cultured in bile esculine azide agar with vancomycin (5μg/ml). Identification to species level was done by Vitek 2 system (bioMérieux, Marcy l'Etoile, France) while susceptibility to vancomycin was determined by gradient diffusion testing (Etest; bioMérieux). All the resistant strains were further considered with PCR method in order to identify the existence of the *esp*, *vanA*, *vanB* and *vanC* genes. At the same time, all the samples were tested with the Genspeed® VanABC plus test (Greiner Bio-One, Kremsmünster, Austria). This system uses rapid bacterial lysis followed by a combination of PCR and hybridization in order to detect enterococci with the resistance genes *vanA*, *vanB*, *vanC* and gene *esp*.

All equipment and supplies were provided by
Greiner Bio-One, Kremsmünster, Austria

	Genspeed® VanABC plus test (Greiner Bio-One, Kremsmünster, Austria)	**Culture on selective media**
sensitivity	81.5%	100%
VRE detection	< 2 h	24-48 h

Results

Of 200 samples 38 vancomycin resistant isolates were recovered by conventional culture method. The majority of the isolates were identified as *Enterococcus faecium*,(81%) followed by lower presence of *Enterococcus faecalis* (10%) and *Enterococcus gallinarum* (9%). 62% of *E. faecium* isolates carried *vanA* gene, 21% of them carried *vanB* and 17% were positive for both *vanA* and *vanB* genes. *vanC* gene was obtained in 2 *E. gallinarum* and one *E. faecalis* strains. Genspeed VRE test compared with the culture method reveal sensitivity: 81,5%, specificity: 90,1%, positive predictive value:71,6% and negative predictive value: 95%. Results obtained by Genspeed® VanABC plus within 2h after the sampling while results from cultures were available within 48h.

Conclusions

The ***emergence of VRE*** as an important nosocomial pathogen is due to its propensity for ***colonization*** of the gastrointestinal tract, the persistence in hospital environments, the genome plasticity and the increased mortality. Although, cultures on selective media seem to be more sensitive for VRE detection, the application of Genspeed® VanABC plus test ***upon the admission*** of the patient offers advantages in time profit. Especially in endemic areas when there has been prior hospitalization in ICU or LTHUs, the ***time till patient isolation*** is valuable to avoid the dissemination of VRE.