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Comparison of PCR (GeneXpert™ vanA/vanB) and culture methods in the surveillance of vancomycin-resistant enterococci

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Objectives: Vancomycin-resistant enterococci (VRE) are important agents of hospital infections in all over the world as well as in Turkey. Early recognition of VRE colonization is important in the control of possible hospital infections. The aim of the current study is to compare the PCR and culture method in the detection of VRE colonization.

Methods: Two hundred ten perirectal swab samples that were obtained using Amies transport medium from the patients hospitalized in the intensive care units of our hospital between January and September 2013 were evaluated with both PCR and the culture method. For the PCR method, a real-time PCR (Gene Xpert™ *vanA*/*vanB*, Cepheid, USA) device was used. The samples were cultivated in enterococcosel agar. The growth in the culture was evaluated daily for three days. Colonies were defined by using conventional methods and Vitek 2.0 system (BioMérieux, France). The resistance was confirmed with the E-test.

Results: Perirectal swab samples (n: 210) were evaluated with both PCR and culture methods simultaneously. VRE was detected in 76 (36.1%) of the samples with the PCR method; 70 of them were found to be *van A*, 2 were *van B*, and 4 were *van A*+ *van B*. VRE was detected in 71 (33.8%) of the same samples with the culture method. Upon the evaluation of the growing colonies in the culture with the Vitek 2.0 device, the two samples that were found to be *Van B* were defined as vancomycin-sensitive enterococci. However, these samples were confirmed with the E-test as VRE, and it was concluded that PCR was correct. One swab sample was studied twice but resulted as invalid with PCR in both study; however it could be found to be negative by culturing. The results of 210 samples that were obtained with PCR and culture are shown in Table 1. The sensitivity, specificity, and positive and negative predictive values of the Gene-expert *vanA/vanB* assay PCR device were determined to be 97.4%, 98.4%, 97.4%, and 97.4%, and for culture 91%, 100%, 100%, and 94.9%, respectively.

Conclusion: In the current study, the sensitivity, specificity, and positive and negative predictive values of both culture and PCR methods were found to be high. Although PCR method seems to be more attractive than culture method, as the results could be obtained in a shorter period, but it is more expensive in terms of cost. Therefore, we believe that all laboratories should choose the most appropriate method according to their own capacities.

Table 1. PCR and culture results

n	PCR	Culture
128	-	-
65	**Van A**	+
4	**Van A+Van B**	+
5	**Van A**	-
2	**Van B**	-
2	**False negative***	+
2	**False positive****	-
1	**Invalid**	-

*Vancomycin-resistance confirmed with E-test

** In the repeated sample, PCR negativity