

Vancomycin Resistant Enterococcus: First Reported Case in Lebanon

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Abstract

In addition to their long established role in endocarditis, Enterococci have grown in importance as Nosocomial pathogens^{1,2}. Vancomycin resistance among enterococcal isolates is an increasing problem and has been reported worldwide since 1988. Here we report the first isolation of vancomycin resistant Enterococcus faecium.

Case report

A 66-year-old man, a heavy smoker with chronic obstructive pulmonary disease, previous hospitalizations and a history of persistent low grade fever, anemia and weight loss and heart failure, was admitted to the Intensive Care Unit (UTI) of the Saint George University Hospital, Beirut, for acute pulmonary edema. The blood cultures grew gram-positive diplococci identified as Enterococcus faecium susceptible to ampicillin (MIC= 0.5 microgram/ml) and vancomycin (MIC=0.06 microgram/ml) (according to the identification methods and susceptibility testing recommended by the National Committee for Clinical Laboratory Standards-NCCLS). The echocardiogram revealed vegetations localized on the tricuspid valve confirming, therefore, the diagnosis of infective endocarditis. Consequently, the patient was treated with intra-venous vancomycin (500 mg / 6hours) for 4 days followed by six weeks treatment with Ampicillin. Two weeks later, fever recurred and blood cultures yielded a highly resistant Enterococcus faecium; the drug resistance levels (MICs in micrograms per milliliter) of the following antimicrobial

agents were: vancomycin >250, teicoplanin= 24, gentamicin= 32, ampicillin=50, and erythromycin>100 (E-test method- AB Biodisks, Solna, Sweden). In view of the persistent clinical symptoms, the patient underwent tricuspid valve replacement. He was treated successfully with amoxicillin plus gentamicin for two months. Tricuspid valve culture revealed Enterococcus faecium with the same resistance profile. An epidemiologic survey was conducted and a series of cultures was obtained from various body sites, as well as from the ICU patients and health care workers. Vancomycin resistant Enterococcus was only found in the same patient's stool culture, suggesting an endogenous origin of contamination. The previous use of antibiotics in this patient, especially large spectrum cephalosporins and glycopeptides, may have helped in the selection of the resistant strain of Enterococcus faecium.

In addition to the phenotype suggestive of Van A³⁻⁶, genotyping of both strains isolated from blood and stools using Polymerase Chain Reaction (PCR) was determined at the Institut Pasteur- Paris and at Saint Joseph Hospital- Paris- France, and confirmed the identification of Van A gene in Enterococcus faecium.

To our knowledge, this is the first reported case of isolation and identification of vancomycin resistant gram positive cocci in Lebanon⁷. Since this case has been documented, some new cases have been described in some Lebanese hospitals, but till now, never published. Therefore, strict surveillance programs for antimicrobial resistance of Enterococci are needed to avoid the emergence and spread of high-level glycopeptide resistance in invasive enterococcal isolates which leave the clinician with limited therapeutical options⁸.

References

- 1- Heath, C. H., T. B. Blackmore, and D. L. Gordon. 1996. Emerging resistance in *Enterococcus* spp. *Med. J. Aust.* 164:116-120.
- 2- Yesim C, Lamela F, and Glen Mayhall C. 2000. Vancomycin Resistant *Enterococci*. *Clin. Microb. Rev.* 13, 4: 686-707.
- 3- Arthur, M., C. Molinas, and P. Courvalin. 1992. The VanS-VanR two-component regulatory system controls synthesis of depsipeptide peptidoglycan precursors in *Enterococcus faecium* BM4147. *J. Bacteriol.* 174:2582-2591.
- 4- Bugg, T. D. H., G. D. Wright, S. Dutka-Malen, M. Arthur, P. Courvalin, and C. T. Walsh. 1991. Molecular basis for vancomycin resistance in *Enterococcus faecium* BM4147: biosynthesis of a depsipeptide peptidoglycan precursor by vancomycin resistance proteins VanH and VanA. *Biochemistry* 30:10408-10415
- 5- Dutka-Malen, S., S. R. Leclercq, V. Coutant, J. Duval, and P. Courvalin. 1990. Phenotypic and genotypic heterogeneity of glycopeptide resistance determinants in gram-positive bacteria. *Antimicrob. Agents Chemother.* 34:1875-1879.

6- Leclercq, R., E. Derlot, J. Duval, and P. Courvalin. 1988. Plasmid-mediated resistance to vancomycin and teicoplanin in *Enterococcus faecium*. *N. Engl. J. Med.* 319:157-161.

7- G.F. Araj. 1999. Antimicrobial resistance in Lebanon. *APUA Newsletter* 17(1): 1-4.

8- Shiojima, M., H. Tomita, K. Tanimoto, S. Fujimoto, and Y. Ike. 1997. High-level plasmid-mediated gentamicin resistance and pheromone response of plasmids present in clinical isolates of *Enterococcus faecalis*. *Antimicrob. Agents Chemother.* 41:702-705.