Occurrence of high-level aminoglycoside resistance (HLAR) among Enterococcus species strains


Department of Microbiological Diagnostics and Infectious Immunology, Medical University of Białystok, Poland

ABSTRACT

Purpose: Today, Enterococcus species are one of the most frequent etiological agents in nosocomial infections. The aim of this study was to determine the susceptibility to antibiotics and the prevalence of high-level aminoglycoside resistance (HLAR) among Enterococcus strains.

Materials and methods: The susceptibility of 85 isolates of Enterococcus (47 E. faecalis and 38 E. faecium) was determined using the disk diffusion method. The results were interpreted according to European Committee on Antimicrobial Susceptibility Testing (EUCAST) guidelines. PASW Statistics 17.0 was used for statistical analysis.

Results: E. faecalis strains showed the highest susceptibility to ampicillin, tigecycline, vancomycin, imipenem, and linezolid, and E. faecium to linezolid, tigecycline, and quinupristin/dalfopristin. Among all tested strains, high-level gentamicin resistance (HLGR) was found in 4% of E. faecalis and 8% of E. faecium strains, high-level streptomycin resistance (HLSR) in 45% and 42%, and HLAR in 50% and 32% of strains, respectively. HLGR was detected only in vancomycin-resistant Enterococcus (VRE)− strains (12%), while HLSR in 76.9% of VRE+ and 24% of VRE− strains, and HLAR in 23.1% of VRE+ and 64% of VRE− strains. The tested strains were also divided into two groups: HLSR+ and HLAR+. In both groups, statistically significant susceptibility differences (p<0.05) were found for ampicillin, imipenem and trimethoprim/sulfamethoxazole. The most frequent antibiotic resistance profile among E. faecalis strains was $S^R$ (resistance phenotype to streptomycin), and among E. faecium, AMP$^R$, IMP$^R$, CN$^R$, S$^R$, SXT$^R$ (ampicillin, imipenem, gentamicin, streptomycin, trimethoprim/sulfamethoxazole).

Conclusions: This study showed the slowly increasing prevalence of HLAR and resistance to newer antibiotics (linezolid and tigecycline) among Enterococcus strains. It is necessary to search for new directions in the treatment of enterococcal infections.

Key words: Enterococcus; aminoglycoside resistance; vancomycin-resistant Enterococcus (VRE).