SUSCEPTIBILITY OF ENTEROCOCCUS STRAINS TO HIGH LEVEL AMINOGLYCOSIDE, AND HEAVY METALS

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Background: Microbes show various types of resistance mechanisms in response to heavy metals. These mechanisms may be encoded by chromosomal genes, but more usually loci conferring resistance are located on plasmids as antibiotic resistance genes. It was shown that the horizontal transferring of these genes is possible between Gram negative and Gram positive bacteria.

Objectives: Investigation of the resistance to high level aminoglycoside (HLA), and heavy metals; lead (Pb^{2+}), cadmium (Cd^{2+}), mercury (Hg^{2+}), arsenic (As^{5+}), in 39 Enterococcus strains isolated from stool and rectal swabs of hospitalized patients. Eleven out of 39 strains were resistant to vancomycin (Van) and teicoplanin (Tec) (VRE), nine of them were resistant to Van and 19 of them were susceptible to all glicopeptides (VSE).

Methods: Antibiotic resistance was determined by disk diffusion, heavy metal resistance was detected by agar dilution method according to CLSI criteria. The range of concentrations for all heavy metals tested was as follows (mM): 0.005, 0.01, 0.05, 0.1, 0.5, 1, 2.5, 5, 10, 20. For the purpose of defining resistance, strains which were not inhibited by 10 mM As, 1 mM Pb, Cd and 0.1mM Hg were regarded as resistant.

Results: HLA resistance was detected in ten out of 11 VRE strains and eight out of 19 VSE strains. Lead resistance was detected in all (100%) 39 strains. Hg and As resistance was also detected in one strain (~3%) each. Cd resistance was not seen. According to these results, seven resistance profiles were shown in 39 tested strains: Van+Tec+HLA+Pb, Van+Tec+Pb, Van+As+Pb, HLA+Hg+Pb, Van+Pb, HLA+Pb, and Pb. Resistance to antibiotics and heavy metals were detected concurrently in 28 (%71.79) of the strains.

Conclusion: In light of the foregoing, further investigations are needed to reveal of a possible relation between antibiotic and heavy metal resistance and the reasons behind lead resistance determined in all Enterococcus isolates.