

TITLE: Vancomycin-resistant *Enterococcus faecium* (VREfm) in hospitals of Rio de Janeiro: a 15 years scenario

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ABSTRACT:

Vancomycin-resistant *Enterococcus faecium* (VREfm) has been prominent in the scenario of healthcare-associated infections, frequently associated with difficult to treat infections due to the remarkable ability of this microorganism to acquire resistance to a variety of antimicrobials. In Rio de Janeiro, the emergence of VREfm was firstly documented in 2002. This study aimed to evaluate the impact of VREfm emergence on the spread of resistance to 18 antimicrobial agents among *E. faecium* strains isolated in Rio de Janeiro from 2002 to 2016. For that, 1005 strains were tested by the disk diffusion method. Most of the strains (74.6%) were representative of colonization while 25.4% were from cases of infection. Among those, 42.08% were recovered from blood, 40% from urine and 17.92% from other specimens. Rates of resistance to ampicillin, ciprofloxacin, erythromycin, levofloxacin, norfloxacin, penicillin, rifampicin, teicoplanin and vancomycin were higher than 90%. High-level resistance to aminoglycosides (HLRA) was found in 57% of the isolates, comprising 42% resistant to both gentamicin and streptomycin. Over a fifteen years period, rates of resistance to beta-lactams and quinolones remained high, while a decrease in HLRA rates was observed since 2008. Several antibiotypes (total of 118) were identified, with the predominance of antibiotype I (28%) and II (22%). Antibiotype I predominated from 2002 to 2008 when antibiotype II has emerged. This change in the prevalence of antibiotypes reflects the decrease in HLRA rates since 2008. We also compared the resistance profiles of strains isolated before 2002 and observed the increase in the rates of resistance to aminoglycosides (12.1% to 57.7%), beta-lactams (27.2% to 99.7%) and quinolones (48.5% to 100%). A comparison of susceptibility rates among vancomycin-susceptible strains isolated before and after 2002, also revealed decreasing susceptibility to aminoglycosides (87.9% to 43.2%), beta-lactams (72.8% to 16.4%) and quinolones (51.5% to 10.4%). The results indicate that the emergence of resistance to vancomycin among *E. faecium* was associated with increasing rates of resistance to several other antimicrobials, probably representing a critical step for the persistence of this species as the predominant VRE in the hospital environment in our State.

Keywords: *Enterococcus faecium*, vancomycin resistance, antimicrobial susceptibility

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