

Title: HIGH-LEVEL AMINOGLYCOSIDE RESISTANCE OF PENICILLIN-RESISTANT, AMPICILLIN-SUSCEPTIBLE *Enterococcus faecalis* ISOLATES

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Abstract:

Enterococci resistance to beta-lactam antibiotics and aminoglycosides is a great concern because it prevents bactericidal synergism obtained by association of these drugs for the treatment of severe infections. Therefore, the aim of the present study was to investigate whether penicillin-resistant, ampicillin-susceptible *Enterococcus faecalis* (PRASEF) exhibit cross-resistance to aminoglycosides and other antibiotic classes. Penicillin-susceptible, ampicillin-susceptible *E. faecalis* (PSASEF) were also evaluated for comparative purposes. *E. faecalis* isolates were recovered from hospitalized patients at a Brazilian tertiary hospital in the period of February 2006 to December 2014. Antimicrobial resistance profile was determined by disk diffusion test. Furthermore, minimum inhibitory concentration (MIC) for beta-lactams (penicillin and ampicillin) and aminoglycosides (gentamicin and streptomycin) was determined by broth dilution test. Susceptibility tests were performed and interpreted according to Clinical and Laboratory Standards Institute (CLSI) guidelines. A total of 100 *E. faecalis* isolates were evaluated, including 75 EFPRAS and 25 EFPSAS. According to disk diffusion test, the percentage of EFPRAS isolates resistant to chloramphenicol (80%), ciprofloxacin (97%), norfloxacin (96%), and erythromycin (99%) was significantly higher compared to EFPSAS isolates ($p < 0.01$), whereas the percentage of resistance to tetracycline was similar (79% and 76%, respectively). Sixty-four (85%) PRASEF and 8 (32%) EFPSAS isolates showed high-level gentamicin resistance ($MIC \geq 500 \mu\text{g/mL}$) ($p < 0.01$). Regarding to streptomycin, only 9 (12%) PRASEF isolates displayed high-level resistance to this aminoglycoside ($MIC \geq 1000 \mu\text{g/mL}$). In conclusion, the results of this study demonstrate that PRASEF isolates exhibit cross-resistance to gentamicin (high-level) and tend to be resistant to multiple classes of antimicrobial agents. Therefore, it is necessary to monitor and prevent the further spread of these multidrug-resistant *E. faecalis* isolates in the hospital environment.

Keywords: *Enterococcus faecalis*, high-level gentamicin resistance, nosocomial infection, penicillin resistance; multidrug-resistant enterococci

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