High Level Resistance to Aminoglycosides in Urinary Isolates of *Enterococci*

Sir,

Enterococci have become important nosocomial pathogens world-wide and are associated with a high mortality. The treatment of these infections poses a great challenge due to the inherent resistance of *Enterococci* to many antibiotics.[1] Infections by *Enterococci* have traditionally been treated with cell wall active agents in combination with an aminoglycoside; however, the emergence of high level resistance to aminoglycosides (HLAR), beta lactam antibiotics and to vancomycin by some strains, together with association of HLAR with the multidrug resistance has led to failure of synergistic effects of combination therapy.[2]

A study was undertaken in this hospital to detect the HLAR in enterococcal isolates obtained from urinary tract infections. A total of 100 consecutive enterococcal isolates collected over a period of 1 year were included in the study. They were identified and speciated by standard biochemical tests.[3] Antibiotic sensitivity test was performed by disc diffusion method as per Clinical and Laboratory Standards Institute guidelines.[4] HLAR of the isolates was detected by using high content gentamicin (120 mcg) and streptomycin (300 mcg) discs and gentamicin and streptomycin EZY minimal inhibitory concentrations (MIC) Strip[5] (Hi-Media).

Out of 100 isolates, 63 were *Enterococcus faecalis* and 37 were *Enterococcus faecium*. A total of 49 (49%) isolates showed a high level resistance to gentamicin and/or streptomycin in this study by both disc diffusion and EZY MIC Strip method. Studies on infections caused by *Enterococci* have reported a varying prevalence of the high level aminoglycoside resistant *Enterococci* from 7% to 44%.[6] The reason for higher prevalence of HLAR in this study could be because ours is a tertiary care center where chronic cases are prevalent and there is wider usage of broad spectrum antibiotics.

In this study, HLAR was significantly higher ($P < 0.05$) in *E. faecium* (56.7%) isolates than E. faecalis (44.4%) [Table 1]. HLAR is due to release of various aminoglycoside modifying enzymes. Combination therapy with cell wall active agents (penicillin, ampicillin or vancomycin) and an aminoglycoside is recommended for the treatment of serious enterococcal infections. However, HLRA will nullify the efficacy of this combination.

Drug-resistant *Enterococci* present a challenge for the clinician and the clinical microbiologist because of their increased occurrence in nosocomial infections. Clinical microbiologist should identify useful antibiotics for treatment. Physicians should use the antibiotics according to the infection-control policies in order to prevent further spread of these organisms.

Although molecular methods and automated systems appear to be sensitive in HLAR detection, they are expensive, time consuming and require considerable expertise. In places where resources are minimal and workloads are high, close monitoring of HLAR in Enterococcal isolates can be carried out by using the high content aminoglycoside discs. The use of these methods may contribute to wider recognition and more scrupulous monitoring for the presence of emerging drug-resistant organisms.

Jyothi P, Metri BC, Peerapur BV[1]

Departments of Microbiology, BLDEU's Shri B M Patil Medical College, Bijapur, [1]RIMS, Raichur, Karnataka, India
E-mail: peerapur_2003@yahoo.co.in

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Table 1: HLAR in *Enterococcus*

Enterococcus	No. of isolates	High level aminoglycosides			Total
		Streptomycin (S) alone	Gentamicin (G) alone	Both (S+G)	
E. faecalis	63	7	9	12	28
E. faecium	37	5	6	10	21
Total	100	12	15	22	49

E. faecalis: Enterococcus faecalis, E. faecium: Enterococcus faecium, HLAR: High level resistance to aminoglycosides